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VOLUME II. NUMBER 1. CHICAGO, JULY, 1901. TEN CENTS A COPY. ONE DOLLAR A YEAR.

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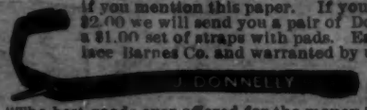

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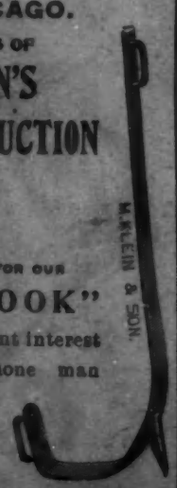

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Alphabetical Index to Advertisers, Page XXXV.

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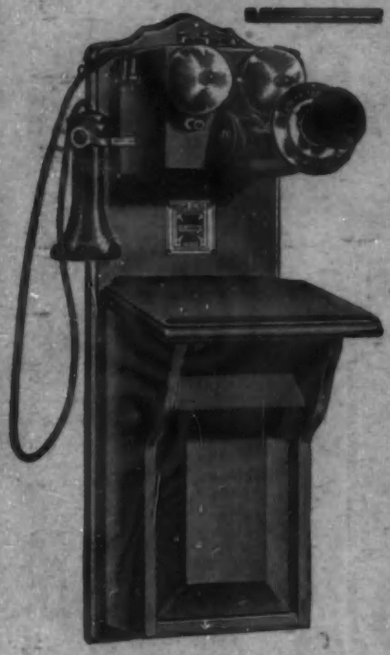

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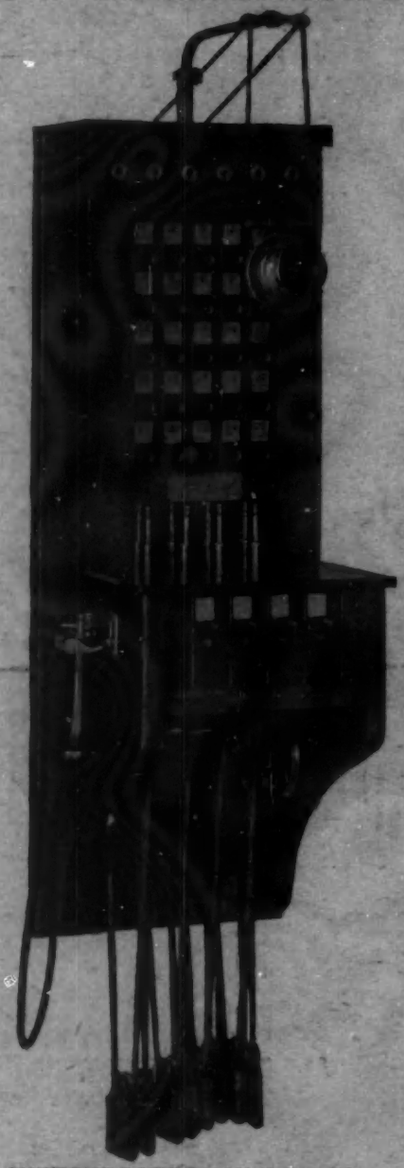

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VOL. II. CHICAGO, JULY, 1901. No. 1.

FIFTH ANNUAL INDEPENDENT TELEPHONE CONVENTION.

The fifth annual convention of the Independent Telephone Association of the United States of America was held in the city of Buffalo, N. Y., on June 11, 12 and 13, 1901. The added attraction of Niagara Falls and the Pan-American Exposition brought what was in all probability the largest gathering of telephone men ever assembled at a national convention. The deliberations of the association were held in the City Convention Hall, corner of Virginia street and Elmwood avenue, while the headquarters were at the Iroquois Hotel. The first feature of the opening day was the arrival at 7:20 Tuesday morning of TELEPHONY'S special telephone train from Chicago, bringing over one hundred western telephone men to the convention. The train was a solid vestibule, composed of Pullman sleepers, compartment, dining, buffet, library, smoking and observation cars, eleven coaches in all, making the finest train that ever pulled out of Chicago. A great deal of the credit for this splendid equipage is due to Messrs. F. M. Byron, general western agent, and L. S. Vosburgh, city passenger and ticket agent of the Lake Shore & Michigan Southern Railway. TELEPHONY takes this opportunity to thank the above officials, as well as those who honored the special train with their presence.

JAMES MILTON THOMAS,
PRESIDENT INDEPENDENT TELEPHONE ASSOCIATION.

The first session of the convention was called to order at high noon on Tuesday, June 11, by Honoroable James M. Thomas, president of the association, who introduced Mayor Conrad Deihl of Buffalo, who delivered the address of welcome. This was followed by the annual address of President Thomas, after which the convention adjourned for the day to inspect the exhibits at the Iroquois Hotel and the Pan-American Exposition grounds.

The second session of the convention opened at 10 o'clock Wednesday morning. Honorable S. P. Sheerin of the New Long-Distance Telephone Company of Indianapolis read a paper on "Village Exchanges and Farmers' Lines." This paper was discussed by Messrs. J. B. Ware of Detroit, Mich., and T. J. Fricker of Ashtabula, Ohio.

Mr. Chas. E. Wilson of the Keystone Telephone Company of Philadelphia, who was to read a paper on "Independent Telephone Development East of the Alleghanies," apologized for his inability to prepare a paper. He made a few remarks and was followed by Senator C. W. Kline of the Interstate Telephone & Telegraph Company of Hazelton, Pa., who read a paper on the subject assigned to Mr. Wilson. Senator Kline's paper was discussed by Mr. C. E. Stinson of the Rochester Telephone Company of Rochester, N. Y. The meeting then adjourned until 10 o'clock Thursday morning. Two group photographs were then taken (which are reproduced in this issue), after which most of the members visited Niagara Falls and other points of interest.

The last session of the convention was opened Thursday morning with a paper on "Exchange Service," by Mr. L. W. Stanton of the Cuyahoga Telephone Company of Cleveland, Ohio, which was discussed by Carl C. Curtis, C. H. Judson, Hugh Dougherty and E. B. Fisher. Mr. Fisher then read a paper on "Bell Methods."

An invitation was announced that Director-General Buchanan of the Pan-American Exposition would meet the delegates in the Electricity Building at 3 o'clock. A rising vote of thanks was given Judge Thomas for his leadership and the good work done by the association.

Honorable H. D. Critchfield of Cleveland, Ohio, then delivered an able address on "Legislation and Litigation," after which he moved the following resolution, which was carried unanimously:

Be it resolved by the Independent Telephone Association of the United States, in convention assembled at Buffalo, N. Y., June 11, 12 and 13, 1901, that the thanks of this association and of all persons whomsoever interested in the wel-

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fare of the Independent telephone movement in the United States is due to the officers of this association for their faithful, intelligent and untiring efforts to promote the welfare of Independent telephony; and be it further

Resolved, That thanks are especially due to Hon. R. S. Taylor, E. P. Payson and others enthusiastically associated for the work done in the litigation recently decided by Judge Brown in the United States District Court for the northern district of Massachusetts, involving the validity of the so-called Berliner patent, and that the successful conduct of this litigation is fully appreciated by this convention; be it further

Resolved, That the secretary be and is hereby instructed to prepare and forward to the persons herein named, copies of this resolution.

Mr. C. S. Bash of Fort Wayne, Ind., followed Mr. Critchfield.

A committee consisting of L. A. Frazee of Indiana, H. D. Critchfield of Ohio and C. W. Kline of Pennsylvania nominated the following gentlemen as officers of the association for the ensuing year, and the secretary cast a unanimous vote for each of the gentlemen:

President, James M. Thomas, Cleveland, Ohio; first vice-president, H. C. Young, Columbia, Pa.; second vice-president, C. E. Stinson, Rochester, N. Y.; third vice-president, W. H. Durin, Cedar Rapids, Iowa; secretary and treasurer, S. P. Sheerin, Indianapolis, Ind.; first assistant secretary, J. B. Ware, Detroit, Mich.; second assistant secretary, C. E. Wilson, Philadelphia, Pa.; third assistant secretary, T. B. Lee, Pittsburg, Pa.

Executive Committee—Illinois, Geo. W. Fair, Chrisman; Indiana, L. A. Frazee, Connersville; Iowa, A. T. Pressen, Iowa City; Kentucky, J. A. Armstrong, Louisville; Louisiana, L. H. Lancaster, Thibodaux; Michigan, J. B. Ware, Detroit; New Jersey, John J. Burleigh, Camden; Ohio, Ed. L. Barber, Wauseon; Massachusetts, Vinton A. Sears, Boston; Pennsylvania, C. W. Kline, Hazelton; Minnesota, C. H. Judson, Minneapolis; Texas, Mrs. Anney McElroy Brett, El Paso; Virginia, R. F. Hogsett; West Virginia, W. K. Cummings, Wellsburg; Wisconsin, I. H. Moulton, La Crosse.

The executive committee met and elected the advisory board for the ensuing year.

Advisory Board—James M. Thomas, Cleveland, Ohio; S. P. Sheerin, Indianapolis, Ind.; Hugh Dougherty, Bluffton, Ind.; H. D. Critchfield, Cleveland, Ohio; E. B. Fisher, Grand Rapids, Mich.; S. E. Wayland, Wilkesbarre, Pa.; W. B. Seaton, Ashland, Ky.; Geo. W. Beers, Ft. Wayne.

The ninth member of the board to be chosen by the other members, place being vacant on account of Mr. Durin becoming an officer.

Moved by Mr. A. T. Pressen of Iowa City, Iowa, "that the convention extend a vote of thanks to TELEPHONY for its interest and enterprise in bringing the western telephone men to the convention on a special telephone train." Motion seconded by Mr. Critchfield and carried.

Moved by Mr. Hugh Dougherty that the executive officers be requested to print the proceedings for general distribution, and to include an authentic list of the Independent telephone companies in the United States. Motion seconded and carried.

Moved and seconded that the convention express their thanks to the press of Buffalo, especially the Buffalo Courier, which has been doing a noble work for the Independent movement in New York and has been hammering it into the people for the past three months in editorials and everything else. Motion carried.

Moved, seconded and carried, that the convention extend a vote of thanks to the mayor of Buffalo for his presence at the convention and his address; also to the local committee on arrangements for making our visit to Buffalo such a pleasant one, and for the use of this hall. Motion carried.

This synopsis is followed by a complete report of the convention proceedings.

THE MAYOR'S ADDRESS OF WELCOME.

On behalf of the city of Buffalo I extend to you a most hearty welcome. I appreciate the business that brings you to our city and I feel the importance of it. I feel that competition is the life of trade, but in your case I think it goes further. I think competition in telephone service is an important matter and is unquestionably a benefit and help to the person using the telephone. I know that the results from telephoning, the question of an answer, the delay in an answer, the vibration of the machine while getting an answer, and all the different intricate studies that belong to the telephone which your meeting will certainly look after will bring betterment not alone in price, but also betterment of service, and if you succeed in that you will certainly be doing a benefit to mankind, as the telephone is almost as necessary an article as food at the present day. Now, gentlemen, as you are in our city, I hope that after doing your business you will take a little rest and enjoy the pleasure of looking at the Exposition; and right while I am at the Exposition, I think you will find a great deal there pertaining to your meeting, especially as we have everything there in the way of modern electricity. Further than that, I hope that our local committee will see that you get the advantage of our beautiful drives and see that you get to our commercial centers and see what electricity really does in our large elevators, mills, factories and printing houses, which are to-day running by electricity supplied by nature from Niagara.

To do this I want you to feel perfectly at home. I want you to go about our city and look at our commerce, our factories and our pleasures and feel perfectly at home. I want you to accept the freedom of the city in the fullest sense of the word.

ADDRESS OF PRESIDENT THOMAS.

All will agree that the committee entrusted with the selection of the place for the fifth annual convention of the Independent Telephone Association of the United States of America used commendable judgment in choosing the beautiful city of Buffalo, as, with its natural advantages and its great Pan-American Exposition, no other city in the United States could have offered a more desirable place for the convention.

Representing, as this organization does, progress in telephony, it is befitting that we meet in Buffalo, where we may study the progress made by the great American countries in art, science and their many and widely diversified industries. We are not only afforded another opportunity of considering further development of our own business, but, between sessions and after this convention adjourns, will be entertained and enlightened by a study of results in all the various fields of private and public progress.

While we are busy with the affairs of this convention and the pleasures which have been arranged for us, we should not forget to thank the local committee of arrangements for its labor.

The past year has been one fraught with important events in the telephone world, and the great work that has been accomplished is the highest commendation that can be offered to the great army of workers in the field. Having been in close touch with all the great Independent organizations of the country, and knowing their present status, I do not hesitate to say that all doubt of the permanency of the Independent telephone movement has passed. Doubters have become its advocates, while the voice of the false prophet is no longer heard in the land, and his writings have been placed in the archives of oblivion, bearing the inscription above its portals, "Failure."

The work in the middle West, North and South, the greatest fields of activity in telephone development, is to be followed by very active development in the extreme eastern and western sections of the United States, and in a short time the organizations, now nearing perfection in those sec-

tions, will show a development that will be highly gratifying to those of us who for several years have labored in the fields now more fully developed.

In speaking of the conventions held by this organization, I have heard several gentlemen who have attended them say that the general tone resembles more political conventions than conventions of allied business interests. I have always agreed with that statement, with a limitation that they have been somewhat like political conventions would be with the politics eliminated. Like public conventions, we have never lost sight of the principles of progress and fair dealing with the people, and, being so different from the meetings of the men who control the Bell companies, this impression has found lodgment in some minds. But this spirit, being the surest sign of the fundamental principles of progress, we desire that it shall always be the keynote of all conventions of the organization.

There has been much inquiry, not only on the part of those who have control of this field of investment, but also by those desiring to enter, as to the underlying principles that actuate the development of this movement. To fully and properly answer that inquiry requires a careful study of the entire history of telephony, and would require more time than those of us who are actually engaged in construction and operation have been able to give to the subject, but a glance over certain events and certain policies will be of interest and profit to persons seeking the knowledge desired by the prudent man before investing in the building or ... phone properties.

The telephone being one of the greatest utilities discovered and put into practical use by man, and being entirely new, and the only means of reproducing articulate speech at a distant point, gave the inventors a right to protection for seventeen years under the United States statutes, which rights the inventors could keep, or sell to others, if they so desired.

Bell's invention, the first put into practical use, and which at one time was a useful and satisfactory transmitter, being what we generally term a magneto telephone, gave place to a more effective instrument; the product of the minds of several inventors, but brought into perfection by that great inventor, Thomas A. Edison. He discovered the fact that carbon electrodes, held in constant contact, but so arranged as to admit of variable pressure in conformity with sound waves, the result of articulate speech, thus regulating the flow of an electric current through them produced by a battery in connection therewith, gave a fuller and more perfect transmitter than Bell's invention.

After this discovery, Bell's invention was fast supplanted as a transmitter by the more effective microphone, but its use as a receiver, in connection with the microphone, has been universal. For the purpose of this investigation, the great volume of records and briefs in litigation between inventors, or their assigns, will be of very little service, and therefore we pass to such facts as will enable us more fully to understand the history leading up to the beginning of the Independent telephone movement.

The first, or fundamental Bell patent, expired in March, 1893, and the second Bell, or magneto telephone patent, expired in January, 1894, and between these dates we find the work of establishing Independent systems began. November 17, 1891, the Berliner patent was issued on an application filed June 4, 1877. The claims of this patent were intended to be broad enough to cover all constant-contact battery transmitters, and these were believed to be all battery transmitters of commercial value.

In May, 1893, the Edison carbon transmitter patent was issued, on an application also filed in the year 1877, and it should be remembered that both the Berliner and Edison patents were owned by the American Bell Telephone Company. This patent was for the use of carbon electrodes in a battery transmitter. No other material has been found as a practical substitute for carbon.

These two patents were for seventeen years from the date of their issue, and if either or both of them had been found valid, it would have continued the Bell telephone monopoly to the year 1908 or 1910.

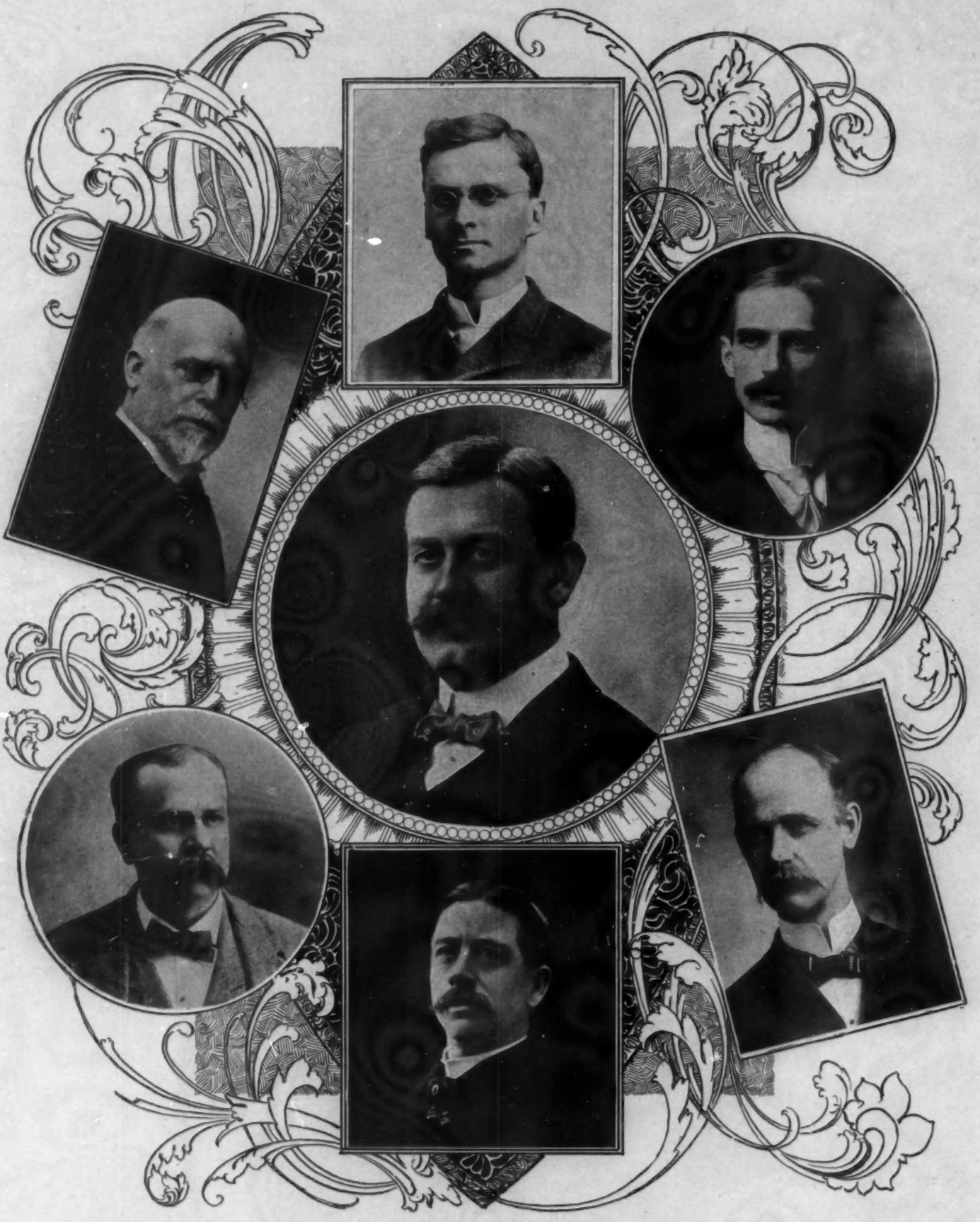
When the Berliner patent was issued, Milo G. Kellogg obtained a certified copy of the record of the application in the patent office, and after a careful study of the same for several months, became convinced that the patent was invalid for several reasons, and would not be sustained by the courts, if intelligently litigated. He also realized that unless its validity was attacked in some unusual manner it would remain as a menace to prevent any extensive competing use of battery transmitters, and when it came to be litigated, if such a case should arise, the defense was likely to be weak and ineffective, and the patent, therefore, likely to be sustained, and thus the Bell monopoly would continue to the end of the term of the patent. He then conceived the idea that the question was one of great public importance and that the patent having, as he believed, been improperly granted, the government itself should begin a suit to test its validity, on the basis of annulling or revoking it. It was then certain that a patent could be revoked on the ground of fraud, but it had not been adjudicated whether a patent could be revoked on the ground of invalidity. The proper channel for bringing suit to annul or revoke a patent was through the attorney-general, in the name of the United States, against the party or his assigns claiming the right of monopoly under the patent.

He prepared a brief of about one hundred and fifty pages, giving the various grounds on which he believed the patent was invalid, and in November, 1892, presented the same to the attorney-general. After the matter had been considered, and with the approval of President Harrison, a bill was filed by the attorney-general in 1893, in the name of the United States, against the American Bell Telephone Company. The first decision in the case was by Judge Carpenter, who declared the patent invalid for two reasons, but did not pass on the other grounds of invalidity which were raised. These two reasons were: First, fraud in obtaining the patent, and, second, the fact that a patent had been granted to Berliner on the same invention in the year 1880. The case was carried to the United States Circuit Court of Appeals, which held that the only ground on which the patent could be canceled or annulled was that of fraud, and that the other claims of the bill could only be set up as defense in a suit brought by the owner against an infringer. This court found that no fraud had been proved, and that therefore the patent could not be ordered canceled. The Supreme Court, on appeal, took the same view of the case.

After the decision of Judge Carpenter in the Circuit Court, the few companies which had begun to manufacture and build exchanges took new courage and many others entered the field, and this new impetus assured our present great success, in spite of all that has been done to discourage us.

After the decision of the Supreme Court in the government case, the testimony was completed in the infringement cases which the American Bell Telephone Company had in the meantime (August 5, 1895) brought against the National Telephone Manufacturing Company and the Century Telephone Company. The defenses in these cases included the same grounds of invalidity set up in the government case, except that of fraud, and the decision of Judge Brown, recently handed down, practically sustains all the defenses except one.

The Edison patent on the use of carbon in the transmitter was no doubt valid, but the question arose concerning it, as to the effect on its life of section 4887 of the revised statutes. The application for this patent was filed before Edison had taken out any foreign patents on the invention, but the patent itself was issued after he had taken out foreign patents, and, in fact, after such foreign patents had already expired. With one interpretation of the meaning of section 4887, the foreign patent would limit the life of the United States patent, and the patent had already ex-



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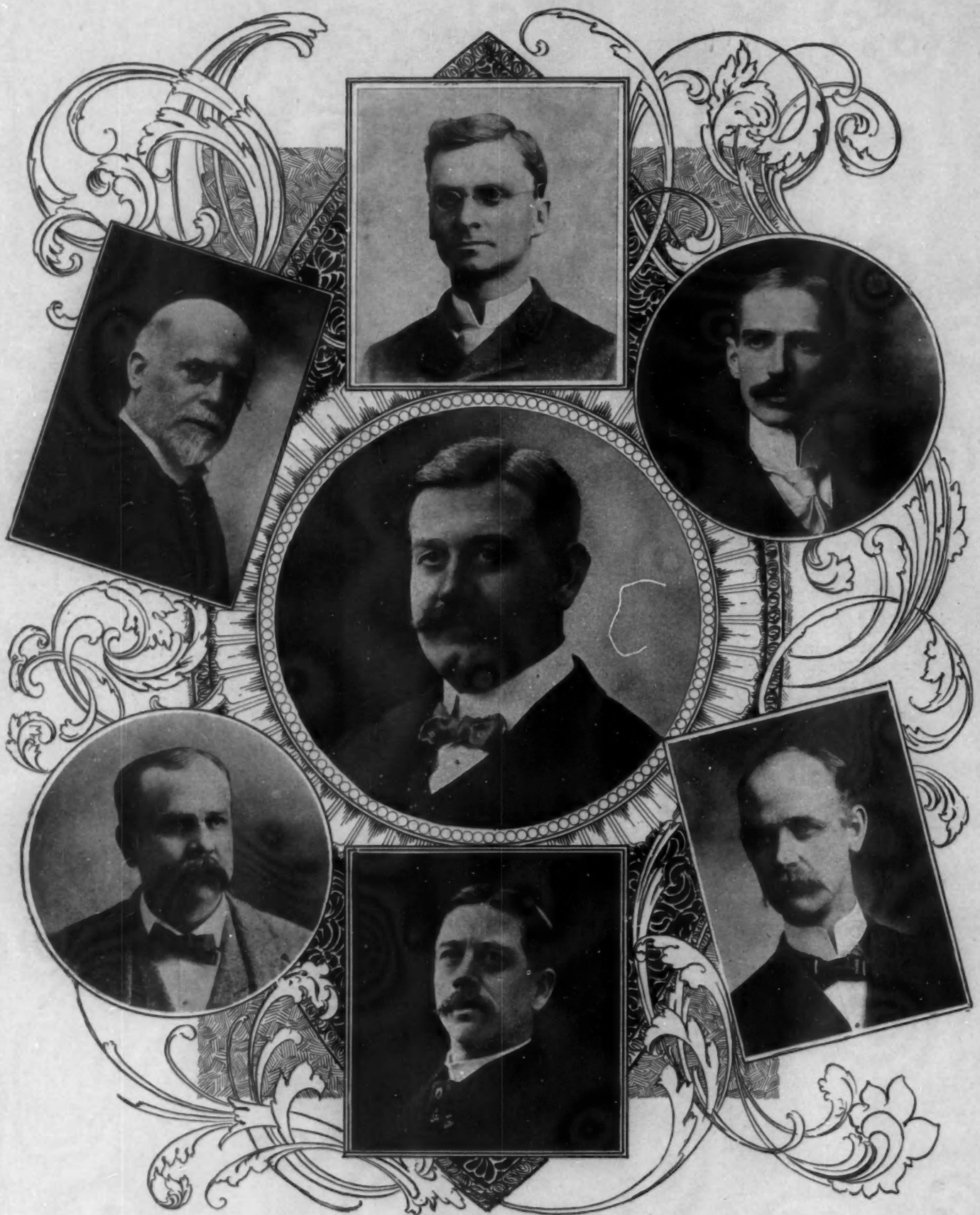

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pired at the time of its issue. The interpretation of this section had already been raised in regard to other patents, but had never been passed upon by the Supreme Court, and it was uncertain what the decision there would be. There was pending before that court a suit known as the Bate Refrigerator Company vs. Ferdinand Sulzberger, et al., in which this particular question was involved. This case was one of minor importance, but on the outcome of the same depended the question as to whether the Edison carbon patent, owned by the Bell Company, and some important electric light patents, owned by the General Electric Company, should extend for seventeen years, or had already expired. When this comparatively unimportant Bate Refrigerator case came to a hearing before the Supreme Court, the side which was favorable to the Bell Company's contention was most ably and elaborately presented. Mr. Storrow, chief counsel for the American Bell Telephone Company, and other noted lawyers presenting very able briefs on the subject. The other side was also well represented, especially by Mr. Wetmore of New York. There was, however, nothing to show that there was practically anything more at stake than the contest between the Bate Refrigerator Company and Sulzberger. At the hearing, however, a request was made and granted that Hon. Chas. H. Aldrich, formerly solicitor-general, be permitted to file a brief in the case on behalf of Milo C. Kellogg, as "one whose interests as an inventor of telephone appliances and as a stockholder in companies operating telephone exchanges and manufacturing electric light and other apparatus, would, in his opinion, be disastrously affected by an interpretation favorable to complainant of section 4887 revised statutes." Mr. Aldrich's brief thus filed, pointed out to the court the great interest involved in the suit, and the legal grounds for an interpretation of the section which would, in fact, limit and make the Edison patents ineffective. The Supreme Court decided the case in favor of defendant, holding that under section 4887, revised statutes of the United States, the expiration of a foreign patent limited the grant under our laws to that time, and, as far as the statutes then stood, the Edison carbon patent became a dead issue.

However, while this Bate case was pending before the Supreme Court, several bills to amend section 4887 were introduced in Congress, the effect of which, if passed, would be to give life to the Edison patent for seventeen years from date of its issue. The real animus and source of the instigation of these bills were not apparent. The fact of their existence, and the real motive and effect of the same, came to Mr. Aldrich's knowledge, and he prepared a memorial to Congress on the subject, entitled "The American Bell Telephone Monopoly, and the Pending Legislation in Its Interests." A copy of this memorial was sent to every member of Congress. The effect of the same was that the real motive for the proposed legislation was exposed, and thus the bills were defeated.

But to show how adroitly the affairs of the American Bell Telephone Company were managed, we must now consider a few facts which were the result of the thought of great minds employed to prolong the monopoly. Edison having applied for foreign patents, and they recognizing the danger of limiting his rights under section 4887, revised statutes, should their efforts fail to repeal or annul it, the Berliner application for a patent was, by shrewd manipulation, kept pending in the patent office for fourteen years, and he, so far as we have discovered, made no application in a foreign country, under the statutes of which the patent in this country would be limited, but only in such countries the laws of which would not bring it under our court's interpretation of section 4887, in view of the danger growing out of the Edison foreign patents. After the Berliner caveat and application had passed to the ownership of the American Bell Telephone Company, which did not claim a constant-contact telephone which would reproduce speech, but a make-and-break transmitter which would reproduce musical sounds, this able corps of experts in the pay of that company managed, after this delay of fourteen years, to obtain a patent by amendment, claiming just the invention that Mr. Berliner had disclaimed in his caveat and original application.

After the decision in the United States Supreme Court in the government case, through the efforts of J. D. Leatherbee, treasurer of the National Telephone Manufacturing Company, Edward P. Payson of Boston, a very able and conscientious lawyer, proceeded with the arduous task of completing the proofs, to sustain the defenses set up in his answer to the bill of complaint in the case of the American Bell Telephone Company against the National Telephone Manufacturing Company.

Mr. Payson gave to this case a great portion of his time and his best thought, from the time of his retainer in 1895 to the time the case was fully submitted to the Court, November, 1899.

Judge R. S. Taylor, having been selected by the government as one of the counsel in its suit, and being very familiar with the questions involved, was retained to file a brief and make an oral argument in the case against the National Telephone Manufacturing Company, on behalf of the defense.

February 27 last, Judge Brown of the United States Circuit Court, District of Massachusetts, handed down his decision after considering the case from November, 1899 to that time; and from his rescript, indicating his deep study of the question involved in this important case, the impartial words of the learned Judge clearly indicate his conviction as to the deep-laid scheme to prolong a monopoly.

We certainly should appreciate the efforts of these men who have so ably resisted the efforts of the representatives of the American Bell Telephone Company to retain that which by law had passed to the people; and no voice should be heard except in the highest commendation of their work. Their intelligent and arduous labors have defeated the skill and cunning of those who were employed to try to deceive our patent officials and our courts. I feel at this time it is not only the duty but the pleasure of this organization to make public acknowledgment of their services.

This combined effort has resulted in the decision of Judge Brown in which he holds:

First. "That at the date of the application, June 4th, 1877, Berliner had not made the invention covered by the patent issued to the American Bell Telephone Company on November 17th, 1891."

Second. "That the invention designated in the patent, is radically different from the invention described in the application."

Third. "That the invention was previously patented by Berliner."

Fourth. "That Edison was the prior inventor."

Judge Brown agrees that the well-known position of all telephone inventors that Berliner, so far as his claim to a microphone is concerned, invented nothing.

These facts, together with the policy of the Bell companies in dealing with the people, have been the chief incentives to invest in this field. The people are anxious for relief from their arbitrary methods and have always welcomed an Independent company.

The success of these Independent companies has been achieved through their reasonable rates, good equipment and first-class service.

Having proven our legal right to give telephone service by good and efficient methods, and having demonstrated our ability to compete with the old companies, it becomes now a question of working together for one common end; and it is important that at this meeting, we consider such questions as will lead us to unity of action. The present year will add much to our present strength by placing a large amount of money at our disposal.

In closing I wish you all a profitable year, and thank you for your many courtesies.

DELEGATES TO FIFTH ANNUAL CONVENTION OF THE INDEPENDENT TELEPHONE ASSOCIATION OF THE UNITED STATES OF AMERICA, HELD IN BUFFALO, N. Y., JUNE 11-13, 1901.

S. P. SHERRIN'S PAPER.

One of the many good fortunes of the farmer is to have constantly at hand some man (or men), from any or all the other vocations of life, ready and willing to tell him what he ought to do.

I regret to say, however, that notwithstanding the very excellent opportunities afforded him to follow the advice of other people, the farmer still persists in having a will and a way of his own.

With all due respect to our farmer friends (and in my high regard for them, I allow no man to go before me), I do not believe that they yet appreciate the great blessing the telephone has brought them.

The telephone—which, after all, has only had its development in the last six or seven years—is a greater boon to farmers than to any other class of people.

The great drawbacks of country life are its isolation, its meager opportunities for social intercourse, and its still fewer opportunities for protection.

When we add to these, the disadvantages of being out of touch with the market, and out of reach of the great news pulse of the country, the sum of the country life's shortcomings is complete.

The telephone changes all this. It comes as a benefactor, exceeding all others in its possibilities and usefulness. No man can fully estimate its benefit to the farmer. It brings his ear close to the market tickers of the world; brings the weather report to his door, in time to protect his crop and cattle, and travels, what would be to him and his horses weary miles, in the ordinary transaction of his everyday business.

The telephone should be welcomed by the farmer—with open heart and ready hand—to the best of everything he has. I regret to say that this is not always done. Our farmer friends still insist, in a great many localities, upon being somewhat beggarly in their treatment of the telephone.

The telephone cannot (any more than any other agency) perform its proper functions, except under fairly good conditions. It is entitled to the very best we can give. It is no longer an experiment; it has demonstrated its usefulness and its right to a forefront position in the economies of life, as completely as have the locomotive, the steamboat, the reaper and the thrashing machine. It was extremely unfortunate in its birth, and its boyhood associations were not good, but it is fast approaching a glorious American manhood—"redeemed, regenerated and disenthralled."

Men do not now hesitate to put sufficient money into railroads; the steamboats on our lakes and rivers are perfect floating palaces, and the wise farmer pays a good price and gets a good article of reaper and thrashing machine when he has reaping and thrashing to do.

It is, I am afraid, a slight reflection on the usual good sense of the average farmer, who has progressed, in other respects, out of the cheap way of doing things, to find him insisting upon putting up cheap, grounded telephone lines, on native poles, three and four hundred feet apart—marring the landscape, and furnishing temptations to profanity by those who have to use them.

A poorly constructed and badly managed country telephone line is many hundred times worse than no telephone at all. There was a time when those things served their purpose as educators, but that time has passed.

The large letter primer (while a very excellent thing in its time and place) is not to be considered, as a means of education, by the chap who has reached the fifth reader, and is already fishing his jaw-breakers out of the century dictionary.

We live in a progressive country. It is our duty to progress with our neighbors. We have no business to be clogs upon the wheels of progress. It is the duty of every fair-minded citizen to undertake to discharge—faithfully and well—his fair share of the obligations of citizenship. The farmer who fails to do this falls short of doing his full duty. The country telephone is fast becoming the most important feature of rural life. It should be treated with the respect and liberality which is its natural due.

The country telephone line (and all other telephone lines which go along the country road) should be considered as part and parcel of the road itself. They should not (in my judgment) be considered as tenants of the road, or as something that is there by sufferance, or by the permission—grudgingly given—of those who for the time do not appreciate its advantages, but it should be regarded as a part of the road itself.

One of the primary functions of roads was that of facilitating messages between civilized peoples. The savages of the forest used their foot and bridle paths to transmit messages of peace or war, love or hate.

Civilization early found its use for the messenger, and so well were his rights established that I believe it was laid down in the early common law, that the pedestrian bearing a message along the public highway, has rights superior to the horseman.

The telephone is a messenger. More than that—it is a troop of messengers. It carries, from home to home, from heart to heart, the messages of the people. It should be as highly regarded and as free from interruption, on the highways of the country, as the bearer of a writ of habeas corpus. There is no other means by which messages can be transmitted with so little wear and tear to the roadway.

I look forward to the time when telephone lines will be regarded as such sacred property that men and boys will no more think of interfering with a country telephone line than they do, now, of throwing stones at windows or killing song birds, as they pass along.

In order, however, to be entitled to this high regard of the public, the telephone must, by its outward appearance, command the respect of the people. We are apt to say, sometimes, that "clothes do not make the man." I think this is true, but we cannot deny that outward appearances go a great ways toward giving good or bad impressions of people and things. Telephone lines should be substantially and neatly constructed. They should be of the very best material—good, heavy, well-shaped poles (no pole shorter than 25 feet nor smaller than six inches in diameter at the top); cross arms should be of regular length, and the wire put on in a thoroughly mechanical manner.

I have an impression that, as time goes on, and our high regard for the telephone increases, we may get along with shorter poles, and put our wires as near to the ground as electrical conditions will permit. My thought is that we will not have to use very high poles anywhere, except at road crossings, and it is barely possible that we may reach a condition where it will be found easier to go under cross-roads than over them.

Wherever it is possible, I think that not more than one line of poles should occupy the same side of the road. It will be entirely possible to build a line sufficiently strong and symmetrical to take on all the lines that should go along any particular roadway.

Of course, it goes without the saying that all lines should be iron or copper metallic, and, as nearly as possible, the maintenance of the whole line should be under the control of one head—without reference to how many persons or companies may be interested in the pole line.

One of the great troubles of the country telephone line—as, indeed, it is one of the drawbacks we all have in cities—is the trees. In the cities we are able to escape this annoyance very largely by the use of cable, but, of course, it would be impossible to do this in the country. Not taking into account the great additional cost of that sort of construction, there are electrical considerations that make a continuously long cable line an impossibility. The trees on the country roads should give way to the telephone.

I am an advocate of trees and believe that we should cultivate our forestry in every possible way consistent with

SAME GROUP AS PRECEEDING PICTURE, WITH HATS OFF, OFFICERS ON BENCH. IT WILL BE NOTICED THAT "TELEPHONY" IS THE ONLY PUBLICATION IN EVIDENCE.

the discharge of our other obligations. But as it was necessary to trim away the original forests to make the roads, so I would trim away the trees along the side of the roads which interfere with that part of the road which belongs to the telephone.

Trees along highways, near residences, can just as well be set back twenty-five or thirty feet. They have no business on the highway or overlapping the highway, when they interfere with the uses of the highway.

The telephone is a proper use of the highway. In many respects, it is the most important use. Being a comparatively new thing, it may take legislatures and courts a little while to appreciate all this, but just as surely as our American legislation and jurisprudence has found a way to clear all other obstacles from the path of material progress, so they will find a way to order the trees along the highways set back out of the way of the telephone. They will do this because the people will demand it—and the people here always get what they want.

Now, as to village exchanges: I believe they ought to be made just as numerous as the wants of the people may require—in fact, I think a great number of small exchanges is infinitely preferable to a number of long, heavily-laden party lines. There is not only utility in this, but a good deal of economy as well.

The larger the number of people to be reached, and the quicker we can reach those whom we desire to communicate with, the better our service will be.

In my judgment, village exchanges should be encouraged everywhere, and these village exchanges should have direct communication with the county seat exchanges and the exchanges in other towns of the county, and these exchanges, in turn, should be connected with the long-distance exchanges of the several states.

Our combination of lines and exchanges should be so complete that the farmer, sitting at his own hearthstone, can communicate, by telephone, with anyone—no matter where located—to whom he desires to speak.

The equipment of those country exchanges should be, in all respects, first class. I regret that this is not always the case. It is often very poor, and I come, now to show some of the causes for this.

With all due respect to the manufacturers—and I think the manufacturers are entitled to a great deal of credit for the development of the telephone business—I cannot help the feeling that they are very largely responsible for a great lot of shoddy, inefficient and wholly abominable telephone equipment in the country. They go upon the theory that the farmer wants something cheap, and that the way to catch him is to present a very low-priced article, without very much reference to how long it will last or what service it may give him in the meantime. This is little short of criminal and cannot be too strongly condemned.

This Association, and all other people largely interested in the telephone business, who want to escape responsibility for bad service by other people, as well as by themselves, should set their faces firmly against the manufacturers who make, specially, "Cheap John" equipment for farmers' lines.

The truth is that for many reasons the farmer ought to have better equipment than anybody else. It is very much more difficult for him to get repairs than it is for anyone else, and besides in the very nature of things he soon becomes very much more dependent upon his telephone than does the man living in the city, whose distances between business associates and neighbors are very much less, and where other facilities for communication are very much more numerous.

Another explanation for bad equipment in the country is the very short-sighted practice indulged in by some city companies of selling their wornout material to farmers at reduced prices. A chain is only as strong as its weakest link; the 'phone or switchboard that is not fit for use in town is certainly not fit for use in the country. "Good equipment everywhere" should be the motto.

The battlefield of the great telephone war, which has been raging in this country for the past five years—with the victories always on the same side—has been largely transferred from the cities to the country.

The Bell companies, in the days of their monopoly—and, in fact, until quite recently—positively refused to furnish service to the farmer upon any terms.

Now they have changed their minds about that, and seem to have concluded that the farmer and the villager are not such bad fellows, after all. But their repentance has come too late. The farmer and the villager have been doing a thing or two for themselves in the meantime. And this is part of what they have done in Indiana. I feel that you will pardon me for talking a little about my own state.

We have had a most desperate fight in Indiana for the past five years, notably for the past two years. We have been threatened by the opposition with everything—from total annihilation to everlasting abode in eternal darkness.

We were assured, upon the honor of the very clever gentlemen who manage the Central Union Telephone Company, that we would lose every dollar we put into the telephone business, with the further cheerful assurance that they knew what they were talking about, and would personally see to it that their prediction would come true.

In furtherance of this last determination, they spent a good deal of their "war appropriation" in superhuman efforts to prevent our people from putting money into the telephone business. It would be amusing now to read some of their statements. They would make the man who was expelled from Hades for incurable falsification green with envy.

We learned, long ago, in Indiana, that the immortal Lincoln was right when he said that, while one might fool part of the people all the time, and all the people part of the time, he could not fool all the people all the time.

When the first Independent telephone exchange was constructed in Indiana, the Central Union Telephone Company had been paying, for twelve years, on a capital of six million three hundred thousand dollars (three-fifths of which was pure water) annual dividends, ranging from 4 to 6 per cent. They had no bonded indebtedness and no floating indebtedness, that was reported.

When the fight with the Independents began, they ceased paying dividends—the last one being paid in 1895. In 1897, they borrowed two and a half millions of dollars; in 1899 they borrowed six millions of dollars, two and a half of which was set aside to pay the holders of the first mortgage of two and a half millions.

They now have, in addition to this six-million-dollar mortgage (according to recent publications), a floating indebtedness of one million two hundred and fifty thousand dollars.

Now let me tell you what all this has resulted in: The Central Union now has (as shown by their own figures) 22,000 telephones in the state. The real number is smaller than this, but we can afford to be generous, and I propose to give them all they claim.

The Independent telephone interests have, in the state of Indiana, by actual count, 52,469 telephones. I know you will excuse me if I repeat those figures. After a "war expenditure" of seven and a quarter million dollars—begun upon the Independent movement when there were less than three thousand Independent telephones in the state—the Central Union now has for its expenditure 22,000 telephones, and the Independent movement has 52,469.

The total population of Indiana (according to the census of 1900) is 2,516,000. There are 92 counties in the state, and there are 27 of these in which the Central Union (or any other Bell company) has no exchange—large or small.

The population of these 27 counties aggregates 491,000 and the aggregate number of Independent telephones in

these 27 counties is 14,262. The total number of Central Union and other Bell company telephones, used at toll stations only, in those 27 counties, is 197.

I submit this Indiana statement more especially for the benefit of our friends in different parts of the country who are just beginning their fight with the great monopoly. If you ask me how they fought us I can simply say—every way.

If there is any mode of guerilla warfare that they left untried, we have not been able to find it. The Independent development in Indiana has been accomplished by Indiana self-helpfulness and Indiana capital. Of the millions invested in the Independent telephone business in Indiana, less than $100,000 has come from outside the state. More than that, the business is practically out of debt. The total indebtedness upon the Indiana Independent telephone property, is less than 10 per cent of its total value.

In this great success the farmers and villagers of the state have been of incalculable help. They realized (as all sensible men, similarly situated, must have realized) that their only hope was in becoming a part and parcel of the great Independent movement.

The Independent movement gives opportunity for self-helpfulness and intelligent co-operation. That which a man can do for himself is most likely to be quickest done. The flexibility of the Independent plan is its greatest recommendation. There is no honest local movement that cannot find a warm welcome and a happy home in it.

It will not do to say that good service cannot be given by the Independents. Every unprejudiced man will say that the most indifferent Independent service in the country today is very much better than the average Bell service was when the Independent movement began.

The Bell companies all over the country are paying us the delicate compliment of imitation in many things, but more especially in their attention to the farmers and villagers, whom, in their halcyon monopolistic days, they so severely let alone.

I would advise our farmer friends the country over to be skeptical about this death-bed repentance:

"When the devil was sick,
The devil a monk would be;
But when the devil got well,
The devil a monk was he."

REMARKS BY J. B. WARE.

Mr. Sheerin has presented in such an able manner this subject that it is exceedingly difficult to discuss the paper except in a very few minor particulars. There is no question but that the farmers' telephone is of greater importance to the entire telephone situation at the present time than many of us realize. There is a tendency in certain districts, because of a lack of communication by telephone, for the farmers to look after their own interests and develop that phase of business for themselves, which has resulted in the establishing of a mutual or co-operative form of telephone business, the one object being to secure communication with neighbors. This kind of service is conducted, not upon a business basis, but upon more of a social basis. The rates are merely sufficient to pay the actual expenses of maintenance, and the maintenance is performed in as limited a manner as possible, with the result that an inferior service has been secured; but the cost of the service, however, is so slight that those who thus build their own lines—and we naturally think more of our own than we do of that which belongs to others—have become satisfied to an extent with the conditions. If they are able in an emergency to reach their doctor or to call upon their neighbors for assistance, they see the advantage to be so great that they are contented, and continue under conditions which are extremely unfortunate for the entire telephone movement. In other words, the farmers' telephone business naturally divides itself into two classes: First, the farmer who resides in the neighborhood of a large city or exchange of importance so that his communication is desired particularly to that exchange center for commercial and business purposes largely. There is no difficulty in providing the metallic circuit, good bridging phones, if party lines are used, and giving service which is entirely satisfactory to the farmer and at a price which is, in a general sense, satisfactory to the exchange owner. With that class of rural telephones we are having no particular trouble. But the second class, which might be termed the social class of farmers, who do not live in the vicinity of a large city, who have no produce to market, do not see the advantages of a good telephone service as a general rule.

I was very much surprised a few months ago in discussing the matter of farm telephones with a man who has built a number of farmers' lines, having from twelve to twenty-five telephones on a single ground wire circuit. I urged the advisability of putting up metallic circuits with not over six instruments on a line. He said to me, "Mr. Ware, you don't understand the farmers' proposition. You go out in that neighborhood, promise them a metallic service with six on a line, and I will follow you and give them the same rate and promise them twenty on a line and I will get more contracts than you will get." And he was right, because what they wanted was to have as many farmers on a line as possible for social purposes. Now you and I can scarcely realize, at least I have had great difficulty in realizing that phase of the telephone business—that what they wanted was not the commercial advantages but social advantages. Now, then, the evil of that is this. No company desiring good service can afford to build that class of telephone lines from a business standpoint. The farmer has had no outlet, as I mentioned, and the result is that he and his neighbors have cut some slim hardwood poles, just as Mr. Sheerin graphically described, and they bought their telephones at $8, $12 or $15, and connect them by steel and often fence wire, and they are actually talking over this class of lines. Their example has inspired the neighbors over in the next township to do likewise, and it has spread until a large portion of the county has been covered by this social telephone system. Some farmer will consent to allow both lines to center in his house, he has a family sufficiently large to take care of the switching as an accommodation, and the result is that man talks ten or even twenty miles over two or three circuits to another farmer perhaps on the other side of an exchange, and it actually costs him nothing. The evils of this free service are apparent to every man in the room. You cannot develop a toll line system to compete with this class of service. I have great confidence, however, in the development of these communities along the line of good service. The Independent companies have made perhaps one mistake more frequently than others in establishing rates that are too low. I am talking particularly of my own state, Michigan. Other states, I hope, are getting larger rates, but in Michigan $12 is the limit for telephone service in farmers' communities, and there is a large number of communities where a less price is maintained. I believe that that class of farmers who use their telephones for commercial purposes, who are not fully realizing the advantages to be gained by telephones in their residences, who are unwilling to pay more than $12, and are now satisfied to go on party lines, will in two or three years, or at the outside five years, demand of you gentlemen that they be given separate lines at higher, yet reasonable, prices. In other words, my opinion is, and I believe yours is, that outside of this social farmers' element the farmers will want separate lines or party lines with but two or three instruments. That means that where we have pole lines with 4½-inch and 5-inch tops, pole lines with two, four or six wires upon them, with perhaps six-pin cross-arms, in the next two or three years we are going to be compelled to furnish additional circuits. We are in the business from a financial standpoint, we want to get as high rates as are reasonable and

fair. The farmers will find that they cannot do business satisfactorily over party lines. Already in portions of Michigan that tendency is manifest.

Now, then, what is the lesson as to construction? Simply this: If you are able, financially, to do it, do it right. If you are not, you ought not to do it at all. You ought to put poles up large enough to carry ten-pin cross arms, and pole lines should be run with the expectation that the wires are going to double or treble in number in the future. The fact is an advantage, and a very large advantage, to the telephone business in certain communities in Michigan, because as subscribers require these separate lines they are willing to pay higher rates and it gives us a chance to grow properly. They would pay nothing unreasonable, but rates that would give us a reasonable return upon the investment, and every farmer and business man expects the telephone men to have a reasonable return upon their investments.

I am deeply impressed with the correctness of the statement made by Mr. Sheerin, that the farmers' telephones have proven of such immense value to the Independents in the past, and that the Bell companies, or at least a portion of them, have reached the point of realizing the importance of this class of business. I am delighted to be informed that the $100,000 president of the Central Union and the Chicago and other Bell interests is opposed bitterly to farmers' lines and has recently caused them to be cut down in some instances. It is the best thing that could happen to the opponents of these Bell companies, because there is no way, in my judgment, for the Bell licensee companies ever to drive out Independent companies except by getting the farmers' phones and forcing the citizens of the cities, towns and villages to take Bell telephones in order to reach their farmer relatives. But, gentlemen, there are a large number of Independent companies that have not developed the farmers' communities. Now, farmers' phones, properly handled, are profitable, and they strengthen the exchanges in a way one cannot realize until you have actually developed the rural territory. You must take care of your farmers, first, for your own good, and for their good, and, second, to weaken the enemy. If you don't do it this year you will find the Bell will do it next year. They are at a point when they must do something, and I look before the year is completed for a great development throughout Bell territory along the line of farmers' telephones by the Bell licensee companies. I am glad that in the territory with which I have been connected the farmers have been taken care of as a rule. The strength and success very largely of the exchanges on the western side of the state and in the central portion of Michigan is owing largely to the fact that the farmers have been connected up only with the local Independent exchanges. But it pays to do what Mr. Sheerin says. It pays to build right, it saves rebuilding, it is economy in operation. It does not pay to buy inferior apparatus, and if there is any apparatus superior to others it should be used on farmers' lines.

What has been said of farmers' lines is true to a very great extent of small village exchanges. I like the idea of connecting but few on a line, running numerous two or three party lines to the farmers' exchanges and then have trunking lines to the city or village exchange.

Personally I want to thank the writer of that article on the very excellent paper, and I want to say in conclusion that we have found in Michigan not only the truth of the statement made by Mr. Sheerin comparatively as between Independents and Bell service, but we find that Independent service in Michigan is better than the Bell in every instance. I don't know of an exception, and I challenge any man in this room to find an instance in which the Independent service is inferior to the Bell. The apparatus used by the Independents is the equal in quality, and in many instances superior to that used by Bell companies in a large portion of the territory developed. There is no reason why we should not continue to keep ahead of the Bell in the next two years in telephone development, as the quality and apparatus and construction of our manufacturers is the most modern. There is no question about the final outcome, because we have the men and the material and the apparatus with which to give the best service. I thank you.

REMARKS BY THOS. J. FRICKER.

I have been trying for an hour to find this hall. I hadn't the least idea that it was in the residence portion of the city. I have been all around the docks, have been transferred by two or three different railways to different lines, and at last I walked up here. I regret exceedingly that I was not here to listen to the paper that has been read on one of the most vital topics that comes before the Independent Telephone Association. I want to say that, having been notified that I was to speak to you, I went down to where speeches are sold and found that every one had been sold and used by gentlemen upon this platform; therefore, gentlemen, what I say to you must come direct from the heart, or from the brain; sometimes we do not locate them in the right place. In order to justify myself, I should further say that I hadn't the least idea that I was to say one word before you until yesterday, when a gentleman called my attention to one of his programs, which I had not seen. A brother of mine, who is secretary of the company of which I have the privilege, and I must say the honor, of being president, received a program and kept it himself. I am to discuss a paper that I did not hear read. I want to say to the association, however, that if there is a single advocate of Independent telephony in the United States to-day that is strong in the conviction that he is right against the great octopus that has been upon the people, I am one of them. If there is any branch or subject of Independent telephony upon which you wish to get light, what is it? If there is any particular subject that is uppermost in your minds concerning which you desire light, what is it? If you want more light on this subject in any of its various phases, indicate what it is and I will give it to you.

But before proceeding to discuss the question I want to supplement what has been read as to the decision of Judge Phillipps, by saying that one of the best courts in the United States is in the state of Michigan. The Supreme Court of this state decided about one month ago that telephone, telegraph and electric railways had the right to cut every branch from a tree that it was necessary to remove for the purpose of carrying out the purposes for which their franchises were granted. I am also engaged in the electric railway business. I recall that along a street where we were building there were seventy-four maple trees and we cut them every one down because they were so far on the highway as to interfere with the purpose for which the street was dedicated. This decision I think you will find in the Review for May. I simply want to speak of Judge Phillipp's decision. I think it is an advance decision, and is one that I hope will be carried up to our higher courts in the state of Ohio. There is no question but that the statutes of Ohio are exceedingly stringent against interfering with private property in the construction of telephone or telegraph lines, and before going any further I want to say that I believe it is to our interests and to the public's interest that some measure shall be taken by our incoming legislature, when they are assembled, more advantageous with reference to country highways than any on the statutes today. They are against us and we should require what is absolutely necessary. Such legislation will give us such rights. To diverge a little again, we have an instance in the construction of our electric railway. On the right side of the road was an Independent telephone line, seven miles of poles belonging to my company. These poles were where every one had to be removed to the opposite side of the street, as the high-tension current transmitted over our own wires from the telephone wires would have made it dangerous to us. We did not have the least objection from a single property owner until we reached one of my own company, upon whose premises seventeen poles were to be set.

Now, I said to our pole men that they should go and move every other pole, leaving the lines for operation on the poles that were standing. They did so until they came to this man's property. There we took out five poles and left the balance standing. The next morning every solitary pole had disappeared. We hunted around the neighborhood, but not a pole could be found, and report was made of this fact. I said, "All right, I will get a horse and drive over." The man's wife said, in answer to an inquiry as to his whereabouts, that she didn't know where he was. I asked where the hired man was and she said she didn't know. I said that she was like the woman whose husband had joined the Masonic order, and upon being asked if he belonged to the Masonic lodge replied, "I don't know, he doesn't lodge here." At last I found him in a field more than a mile away. I said to him, "Those four or five poles that were in our line there are missing and we want them brought back." He denied knowing anything about them. I said, "That question does not enter into it. I insist that the poles shall be returned." He was drilling corn at fifty cents an acre. I told him I did not care how expensive it was to quit; it was the lost poles I was after. The result was that he unhitched his horses, driving through fields in his hurry for fear an officer might take him in. He found the five poles and put them in the very holes that had been dug for them. To cross that farm required sixteen or eighteen poles and every pole has been set. All that is necessary when you want a bring a man to time is to make him believe you have rights whether you have any or not.

Now, gentlemen, I am extremely pleased to appear before you to-day. There is no one thing more gratifying to me than to see this fifth national assembly of the Independent telephone people of this United States assembled in this beautiful city to-day, and one of the most gratifying features of this whole thing is the fact that I see among our midst the same gentlemen whom we have seen with us for five consecutive years. What does it mean? It means simply that your investments, your interests in Independent telephony of the United States were not of a transient character. I dare say, as I look on you to-day, that there are not to exceed a score who make independent telephony a business of itself. I believe with most all of you it is a side issue. It is not your life business. You are not devoting your entire time and attention to it. If you have taken an interest in it, and the fact that you are assembled here to-day is a stimulus to the rest of us who have entered in the early days and have continued in it to this day. A great German professor once said, "When appearing in a school among urchins whose feet barely touch the floor; when I look upon an audience like this of these children I feel like taking off my hat, for I look upon the rulers of the nation that are to come." When I look upon this audience I see the men who will control the telephone situation in America in years to come. There is no question of it. Who would have believed five years ago, when the first National Association was held, that each and every one of you to-day would stand up and enumerate any such number of connections with your switchboards as you have to-day? Who would have believed that we could sit in our offices and homes and talk over the country to the extent we have? And we could not have done so had it not been for the persistent effort, the untiring effort, of such men as this gentleman who sits before you to-day, Judge Thomas, and there is a score which I spoke of a moment ago, but uppermost of all sits Judge Thomas. His efforts and a few of the men who have gathered about him are the men who have given us to-day what we call the long distance connection. Have you ever thought for a moment, gentlemen, how many there are who have built exchanges who would have simply given up or been wiped out for fear on the part of your subscribers and stockholders if it had not been for this National Association? I would like to know how many people there are here to-day who have ever had the question come up at their stockholders' meeting or directors' meeting, the question of injunction or what the result would be if the Bell company were to get an injunction. I know that question has arisen in ours. I said to them that the National Telephone Association would take care of it. We started with 125 connections. We have to-day 900, and we can't take care of them. We have laid out and rebuilt a three-story building for our use. The two upper stories of it we will use for our exchange. Starting with 125, do you believe we could ever have done this if it had not been for the National Association? No, sir; there is not an honest man here who believes this could ever have been done if it had not been for the National Association. I know in these different gatherings we have said, "What benefit do we get from this National Association?" If you don't get any other, gentlemen, your allegiance should be so fixed that you should never lose it, if for no other purpose than you have been fostered in your infancy and have been protected against any local litigation that may have been brought against you by the Bell company. That single item in itself is enough to warrant you in continuing your allegiance to the National Association. But that is not all of it. How many of you are there who have gone to subscribers, or those whom you hoped to be subscribers who use long distance lines, and they have said to you, "When you can give us this place, or when you can give us that place, we will take a telephone." There were no federal, no United States companies then in existence. They sprung into life later, and they are to-day what has given us prestige in our own individual localities, and they are still extending their lines, and it will not be many years until, like the Bell Company, you can talk to any metropolis in the United States. I believe, always believed that these things were not sufficiently impressed upon your minds. Those of you who heard my feeble voice at every convention will remember that I have never turned away from that line.

I regret I have not been able to discuss the paper, for the subject of farmers' lines is of vital importance. A few years ago such an expression was not known,—farmers' lines—five years ago the term farmers' lines would have raised a point of inquiry. Many of you know to-day what it is. How many are there to-day in whose localities the Bell people are formulating a plan to establish farmers' lines. What is the object of it? They are trying by this means to force the people in the cities and villages to take their phones. They are to-day seeking to establish farmers' lines, many of them on a line. You have got to entertain the proposition and take it up. If you don't they will come in and take it up against you.

Now, there is another proposition. Two years ago, perhaps, I spoke to you with reference to telephone girls. If there is any one thing that is essential to the success of your exchange it is the girl who answers the subscribers in your exchange. If there is any fault found with your management to-day and brought to the attention of your local officials, is it not as much the fault of the girl who operates in your exchange as from any other cause? Is not the majority of the multiplicity of complaints that come before his attention of the girls in your exchange? You have invested thousands of dollars in switchboard, you have invested a like amount in poles and line, and when you come to place your national bank, as it were, with all its capital, in the hands of an inefficient cashier, who for a moment would think of it? Not one of you as business men; and the moment you invest thousands in switchboard and poles and line construction, and then place the full operation of this investment in the hands of inefficient girls sitting at your switchboard, you make a sad and furious blunder. Now, you cannot do too much for them—$3 a week, $4 a week, $5 a week. What do they do for you? They return you your dividends, they increase your subscription list, they make all there is of your exchange. It is she who answers back and says, "Number," that either makes or defeats your exchange, and next to the homage you pay to

your wife and mother, pay it to the girl who sits at the board and operates your exchange. Extend and afford her all the comforts within your reach. Don't overwork her, and if you take your hat off to any lady, take it off to the one who is serving you in your exchange. Extend to her all the comforts, everything that is possible in order to make her efficient. It is money well invested. No question of it. Those of you who have employed these tactics know it. Those of you who have failed may well hide your faces in shame. I hope there are none. I would not believe that men who year after year leave their places and leave their office and come to this three or four days of convention—I would not believe that such a class of men would for a moment treat any of their employes other than as they ought to be treated. But if any of you have, or are tempted to do so in the future, just look at me and just think for a moment that your treatment of them is nothing as compared with what I would do to you if I knew it.

Now I don't think of anything further I can say, gentlemen. I won't take more of your time, but if there is any question any of you gentlemen want to ask me that may have arisen in the paper that has been read here I would like to answer it if I can. I thank you all for your attention.

REMARKS BY CHAS. E. WILSON.

Our plant in Philadelphia will be in operation by October if our contracts for cable and switchboard do not disappoint us. We would like to invite you to hold your next convention in Philadelphia. Philadelphia has quite a reputation as a convention city, has fine drives and claims the finest park in the United States. If your executive committee can see your way clear to come to Philadelphia for your next meeting I will guarantee on behalf of our company to provide ways and means of seeing these parks, provide a meeting hall and an excursion on the Delaware. I think it might be a good idea to make a trip to Atlantic City from there, as I presume many of your members have never been to Atlantic City, which is one of the foremost resorts in the United States. I understand the question of selecting the place of meeting is left with the advisory board. I just wish to ask at this time that those in favor of Philadelphia use their influence with the board to have them call the meeting at that place.

Our conduit system and cables are laid out for an ultimate capacity of 30,000. We are erecting no poles, making all of our house connections underground. We have most of our conduit work done. Everything has been prepared and we can assure you there is no question about there being Independent service within the year. We have something over 4,000 contracts now, all five-year contracts. We are getting contracts at the rate of 75 to 80 per day, averaging two contracts per man per day. The Bell Company had in January 10,025, the city having a population of 1,320,000. We consider that we have a most modern telephone plant, from an engineer's point of view. We have the Kellogg boards, and the telephones we designed ourselves and get them manufactured on our own specifications, our engineering department doing the designing.

Our business rate for single party lines is $80; two-party line, business, $52; residence rate, single-party line, $48; two-party line, $36; nothing more than two-party lines. The Bell Company charges $160 for unlimited business service. Their residence service is measured, a good many party lines in the suburbs with four and six on a line, and they are not giving satisfaction. They have been putting in 'phones free for some time, take a contract for a year and give him service for six months free. This does not seem to be interfering with our progress.

REMARKS OF C. E. STINSON.

I am not exactly prepared to discuss the paper prepared by Senator Kline of Pennsylvania, but I will make a few remarks in regard to the Rochester Telephone Company, not about what we are going to do, but will tell you what we have done. Fifteen of the prominent citizens of Rochester came together in May, 1899. They decided that the service given by the Bell Telephone Company of Rochester was very inferior service. The company was organized at that time and application made to the city for a franchise. After considerable trouble in seeing several people, a proper proposition was made to the city, in which the Rochester Telephone Company agreed to furnish 1,500 bona fide contracts and present them to the mayor. In addition to that they agreed to give the City of Rochester 43 telephones in consideration of this franchise. Solicitors were sent out and contracts secured without any trouble. They were presented to the mayor and the franchise was granted. Material for construction was at once ordered and the work was started. All the material was ordered on the first of September and enough to finish the whole plant. On the 6th of October construction had started. In the meantime the lot had been bought for the building, and a two-story building was erected. On May 10th of the following year the exchange was opened with 1,700 subscribers. The construction at that time was laid out for the equipment of about 2,500 telephones, the Bell Company having in the City of Rochester about 2,200. About 1,600 were of what is known as the party line system, five and six on a line. The rates at that time of the Bell were $64.00 for an unlimited, metallic circuit service for residences and $84.00 for business. The rates of the Rochester Telephone Company which were agreed upon in the franchise were placed at unlimited service for $48.00 for business, $30.00 and $24.00 for residence; no party lines at all. The $24.00 rate includes everything within a mile of the exchange, the $30.00 rate takes in everything outside of the mile and within the city limits. On May 10th, as I stated, the exchange was opened with 1,700 subscribers. The business increased so rapidly that on three different occasions I have been compelled to enlarge the cable capacity. The switchboard had a capacity for 3,600, equipped at that time for 2,500. I saw the increase coming and added 500 lines. I had not the equipment ready, however, when I had to increase to 3,600 lines, the ultimate capacity of the board today. We have to-day 3,700 subscribers. The Bell claim possibly 2,200, but I don't think they collect rentals enough in the City of Rochester to pay the pay-roll. They are giving free service for three months for a year's contract, putting in what is known as the American Message service, placing a telephone in everybody's house, particularly those where we have taken them out for non-payment of rental, and establishing there a nickel-in-the-slot machine.

We know and we feel that we are doing the business of Rochester. We are answering to-day on an equipment of 3,600 lines, 50,000 calls in ten hours, or 60,000 calls in twenty-four hours. The unlimited service accounts for this, of course. We are operating several small branch exchanges on account of the sudden landslide in business, filling up our equipment.

Another thing we have done in Rochester, we have installed 250,000 feet standard underground cable in the conduits with high and low tension wires. This matter has been before the courts for some time. The City of Rochester served an injunction on the Bell Company restraining them from building any more conduits. The result is they put up the claim that it was extremely dangerous and that we would set fire to the town, kill everybody, etc. The restrictions that have been placed upon us are very severe. We have been compelled to do all the inside wiring under the specifications of the State Board of Underwriters. The 250,000 feet of cable is now in operation and has been since the opening of our exchange. We have no induction, no disturbing element of any kind, and we parallel these high tension wires.

The citizens of Rochester have supported us at every step, they have taken a great interest in our exchange. We occasionally have visiting days, and on our anniversary opening day this year we had 15,000 people visit us from the City of Rochester, and there is not a day that we have not any

number of subscribers call. Our policy is not oppressive, it is to treat the people with all due respect to which they are entitled. Rochester several years ago, you will remember, had some trouble with the Bell people. What is now called a strike had taken place there between the Bell and the subscribers. The Bell demanded that which the people thought was not right, and every one hung up his telephone receiver and for six months there was not a telephone in Rochester that was used. The Bell people in Rochester have lost all their prestige on account of the tactics they have used. They have changed local managers three times within the last year and a half, which would indicate that something was wrong.

In addition to our Rochester exchange we have been rather slow in extending our toll lines for the reason that we have increased our capacity from 1,700 to 3,600 in one year, we have added 2,000 telephones, so you can readily see that the work in Rochester did not give me much time to look after toll lines, although I have about 160 miles of poles.

When a new company was first talked of in Rochester the Bell people thought at that time that it was impossible for any Independent company to build a plant, at least within five years and they were not prepared for what has taken place. They told the people we could not get a switchboard; they covered all the patents. They also informed them after contracts had been given for switchboard and cable that the system which we had adopted could not work in an exchange of that size. Well, we opened our exchange and everything worked all right, they tried to block us in our construction, in every respect as you all know. In one instance a building which we wished to contract for had about 100 Bell telephones in it. They entered the building through aerial service. I went to the owner of that building, laid out a plan of distribution, showed I would come in underground, and the proposition I made to him was accepted upon these terms—that whatever we distributed throughout the building in the way of conduits we should jointly allow the Bell Telephone Company to occupy. This I agreed to. The result was that I wired this building, put in our conduits, the installation was made and the service opened. The Bell people then went to their subscribers in this building, stating that the owner of this building had compelled them to occupy this same conduit with the Independent telephone wires, and that it was very dangerous to occupy a conduit with high tension wires. It did not seem to worry any of the people. The result was the Bell stated if they were not allowed to enter the building some other way they would remove their telephones, and they found they would have to enter our conduit or go out of the building. They finally concluded the best way was to pay their share of the conduit.

The construction of toll lines around Rochester, and, in fact, Buffalo, is a hard proposition. The roads are crooked, hilly and very thickly settled with trees, and the property owner, as a rule, objects to any more poles and strenuously objects to the trimming of trees. We find in all cases that we have to buy right of way. The consideration, of course, varies, and this is one reason why we have not what is commonly called farmers' lines, but we have everything covered within a radius of eight miles, and we term them "farmers' lines," but our farmers' rates are a little different. Our toll lines are all constructed of 25-foot poles, 6-inch tops, with ten-pin cross arms, full copper wires, six instruments on a line. The rates for these lines are $40 and $50 on five-year contracts, and we don't think there is much money in a $12 rate around our place, and this is perhaps one reason we have not got as many farmers' lines as many other companies. However, we don't think we will change our rates; we prefer to build good construction and make the rates as low as possible and get a reasonable return on our investment.

In regard to the service of an Independent telephone company: It is dependent to a large extent on the operating department. I have paid particular attention to the service. The morning we opened our exchange 27 of the Bell operators walked over and went to work, among them some who had been called down many times for the service they had given. When employed by our company we presented a set of rules. The result is they have all complied with these rules, and we believe they are giving as good service as any exchange in the country. The salary paid to these operators is perhaps a little higher than many of the companies pay. Our salary per operator would average $5.44 per week. We have taken care of the maintenance of our plant with two trouble men, one instrument man and two inspectors.

In reply to Mr. Wilson's invitation to hold the next convention at Philadelphia, not wishing to oppose him in any way, I would invite the next convention to be held at Rochester. Of course, it is a little near to Buffalo, and I don't know as we have especially fine parks to show you, but we can show you what we think is a nice Independent exchange.

C. W. KLINE'S PAPER.

I have been invited to tell you something about the development of the Independent telephone east of the Alleghanies. The subject is one that appeals to me strongly, and I am only sorry that lack of time prevents me from doing full justice to the subject.

About five years ago the question of better and cheaper telephone facilities came under discussion in what is known as the East. The result of the discussion was that here and there small plants were installed and in a small way local service was instituted. The first plants were crude, the switchboards somewhat inferior, the material, I am sorry to say, not of the best, but at any rate in even this inferior construction and poor equipment it was found that as good, if not better, service was given than had ever been received from the Bell companies, and even under adverse circumstances the plants held their own, and in nearly every instance doubled or tripled the number of telephones owned by their rivals. The people—the business world—were with the Independent companies. The Bell monopoly had disregarded their needs, charged exorbitant prices for inferior service, cared nothing for their necessities, so they were ready to welcome competition, which they firmly believed could only result in benefiting them. So from the very start the cause of Independent telephony was made the cause of the people, and results to-day amply demonstrate that the people were right, and human progress received another strong push upward and onward. While our infant plants were struggling for existence, were trying to bring order out of chaos and carry out promises to the public, they were encouraged and sustained in their efforts by news that floated across the Alleghanies from the giant West, where earlier efforts had been instituted along Independent telephone lines—they told us first, that their plants were successfully working and soon came the glad news that at the reduced rates they were giving the public the plants were paying a fair return to the investor. This was all that was needed to give impetus to the movement in the East. Soon larger plants were installed and the question of local toll lines was being discussed, and the question of securing franchises for the large cities was undertaken. This in many instances was found to be an extremely difficult task, a rival firmly intrenched with unlimited financial backing threw every obstacle in our way, but we worked steadily on (in some instances it has taken three years to get a franchise), but with a persistence and energy that would not allow defeat and failure the fight was kept up until monopoly and corruption went down before our just claims, and to-day the Independents have a franchise in every large city, excepting Washington, east of the Alleghanies, and not only in the large cities, but in the boroughs, towns, hamlets and villages, at the crossroads and leading farms the tinkle of the call of the telephone bell is heard everywhere, bringing our East so near together that we are all neighbors, and already the plans are prepared and the routes surveyed across the Alleghanies that will link the

East with the West, and we hope by the time of the meeting of the next annual convention that Boston, New York, Philadelphia and Baltimore, and all surrounding territory will be greeted by the trainman's cry, "These toll lines for Pittsburg and the West." While much has been accomplished in a very short time, much still remains to be done. Some of our principal cities are fully built and some are building—all are in motion. Under the splendid management of S. E. Wayland superb plants have been installed in Scranton and Wilkesbarre, Pa., covering the Lackawanna and Wyoming valleys with an easy possibility of 30,000 'phones in sight and 7,000 'phones now at work; Allentown, the center of the Lehigh telephone's system, with a possibility of 5,000 'phones, with about 1,800 installed, has a splendid system, well built and equipped. Then Reading, which is being built, Easton working the lower Lehigh; the Overland of Lehighton reaches out its tentacles for everything in sight; the Anthracite of Hazleton, embracing everything in lower Luzerne, upper Carbon and northern Schuylkill counties; the Standard of Bucks and Montgomery now being rebuilt by G. S. W. Brubaker, covering all that section; the United Telephone companies, embracing Norristown, West Chester, Lancaster, Lebanon, all of the Schuylkill, Northumberland, Montour and Columbia counties, and the north and west branches of the Susquehanna. Harrisburg is building, and Columbia and York, connected via Carlisle with Chambersburg, extending its lines in every direction in York and Lancaster counties and connected west to the Alleghanies. Philadelphia, under the able management of C. E. Wilson, general manager, is building one of the finest plants in the world. All of New Jersey is awake, are up and doing. Every town in the state has an Independent plant, and they are giving good service. Fine plants have been installed at Rochester and Albany, which, we understand, are giving good service from the Hudson to the Mohawk Valley. The United Telephone Company of Pennsylvania cover the southern portion of New York state. The Maryland Telephone & Telegraph Company has a splendid plant at Baltimore, and the chain of Independent companies stretch south along the Atlantic to the Gulf of Mexico. New York City, the metropolis of our land, has wakened from her lethargy and we are promised in the very near future a thorough, complete service. The New England states are falling in line and new plants are being constantly installed, and some very good ones are already in operation. Boston, the hub of the universe, already has a finely installed system and is enlarging and perfecting it. So we say to our friends from the west of the Alleghanies that there is something doing in the Independent telephone world east of the Alleghanies. While local plants have been successfully installed everywhere, except in a very few isolated instances, we are beating our older rival on the general average at least of three to one, and I predict that in a very short time that the territory east of the Alleghanies in Pennsylvania, my native state, will have more Independent telephones than the Bell has in the same state, both east and west of the Alleghanies.

Now, while we are quite long on local plants, we are yet a little short on toll lines, but we are trying to remedy this as fast as possible. Already the Interstate Telephone & Telegraph Company has built lines in the east portion of the state of Pennsylvania, connecting up the entire eastern portion of the state with some fourteen thousand 'phones, and has its terminal facing New York City at Trenton, and traveling along for twenty miles along the outer edge of Philadelphia, ready to jump in and connect with the first telephone installed there. They connect at Trenton with the lines of the State Telephone Company of New Jersey, that extends from Trenton to Jersey City. The Interstate is ambitious and willing, ready to contract with and extend its lines to exchanges wherever needed, ready to cross the Alleghanies and make the chain complete that shall unite the West with the East, a grand telephonic brotherhood; but to do this successfully they must have the contract of all the Independent companies along their pathway, as well as their encouragement and good-will. The difficulty with the toll line question and the obstacle that has so far retarded its progress, is founded on the inherent selfishness of humanity. We have too many companies ambitious to control the toll line situation in the East, and it will take a little time to reconcile the differences and brush away the selfishness. All this, we hope, will take care of itself, because we believe that fair-minded men can meet and agree on what is mine and thine in regard to the territory, and, having so agreed, they can pool their interests and bury their differences. We cannot afford to fight among ourselves; we should try to remember that we have a resourceful business foe to oppose our every forward movement, and that we must stand together if we would deserve success.

Now, gentlemen from the West, the East salutes you and assures you of their most distinguished consideration. While we may have seemed a little slow at the start, we warn you to look well to your laurels or we will surely overtake and pass you in the march to telephonic perfection. We expect the time to come in the very near future when telephones in the East will be as common as shoes, and twice as necessary, and to that end our efforts will be concentrated. We say to our friends, North, South and West, the territory east of the Alleghanies is all right telephonically, 50,000 telephones are tinkling at the call of subscribers. We are right in the great Independent telephone procession, and we mean to get to the right of the line and stay there.

L. W. STANTON'S PAPER.

This subject may be divided into three important branches—reliability, promptness, good transmission. Any of these if not up to its highest state of perfection, mars the general result.

The first of these, we all know, is of the utmost importance, for the business man of to-day will not for a moment tolerate unreliable service.

The second, promptness, is an essential quality of popular service. There is nothing more annoying to the modern business man than slow service. When he steps to the telephone he expects an immediate reply, and if he is compelled to wait even for a short time he is very likely to become dissatisfied with the service.

For good transmission, as well as reliable apparatus, we must depend upon the manufacturer. The Independent telephone interests are to-day in greater danger on account of some of the inferior apparatus that is being thrown upon the market than they have ever been from the old monopoly. Some of the apparatus that is being sold to-day by the Independent manufacturers is a curse to Independent telephony. It only half-works. It is unreliable, it does not give good local service, not to mention the poor results obtained when using the long-distance lines. Every telephone that is installed to-day should be one over which conversations between New York and Chicago can be carried without difficulty, for it is only a matter of a short time till every telephone in this broad land will be connected with a network of long-distance lines to every city, village, town and hamlet. The continued use of inferior apparatus will mean unreliable service, poor transmission, expensive maintenance and a final discarding of same at a great loss, and, worst of all, dissatisfied subscribers. I feel sorry for the Independent interests when I see this inferior apparatus being installed in exchanges that are being newly equipped. It is true it is difficult for the Independent telephone companies to select the best apparatus, for, as a rule, their experience has been limited to the use of apparatus that was furnished them a few years ago. Another reason is the unparalleled strides that have been made in telephone manufacturing within the last few years. They have been accustomed to the old magneto drop board, which is undoubtedly a thing of the past in exchanges of any size. It is the opinion of the writer that in any exchange of over one hundred

subscribers, where suitable arrangements can be made for current, the only thing to install is a central energy lamp signal board with double supervision. This style of board saves an operator a great many moves, such as restoring line signals and cutting in on subscriber's line to inquire if party answered, or if they are through talking, for with double supervision she can tell at a glance whether the called-for party has answered, or if the conversation is finished.

Wherever an exchange requires three or more operators a multiple board should be installed, for wherever transfers are used they impede the service and add permanent expense to the operating. On a large transfer board you almost double your work, for nearly every call has to be trunked to a second operator, while with a multiple board each operator handles her subscribers' calls direct, without assistance. Another distinct advantage of the multiple board is: One operator in the evening and on Sundays can sit at one position and answer all calls through the multiple. In this way, with double supervision, she has control of the entire situation.

I do not doubt that some of you are of a different opinion, but I will endeavor to show why this class of apparatus is superior.

It gives better service.

It is cheaper to operate, first, because it requires fewer operators; second, because it dispenses with hundreds of local batteries scattered over miles of territory; third, it does away with an expensive piece of mechanism, the generator, with its cog-gears, shunts, commutators, etc., which have a constant source of wear and tear. Fourth, in eliminating the generator and batteries the number of inspectors can be reduced, which is no small item.

The following will give you some idea of the saving in the cost of current for an exchange of one thousand subscribers. Taking the cheapest form of battery, which is the dry cell, at fifteen cents each, and using two cells per 'phone, which is modern practice, it gives a cost of thirty cents per 'phone. Allowing the battery a life of one year, which is more than the average, we have a cost of $300 per year, or $25 per month, for the one thousand 'phones.

In one of our central energy exchanges for something over one thousand subscribers I find the average cost of all current for operating line signals, supervisory signals and all current used for talking, to amount to $6.40 per month, which is about one-fourth of the cost for current for operating the same size system with local batteries, to say nothing of the additional cost of labor for renewal and maintenance.

From a number of monthly reports of trouble covering both common battery and magneto type exchanges, I find that the number of cases of trouble at the subscriber's instrument is from two to four times as great for local battery plants as it is for the common battery plants. With one of the latest types of central energy telephones the trouble of the subscriber's station is reduced to a minimum. There is practically nothing left but the transmitter, receiver, and signal bells, and these as they are made to-day by some of our best manufacturers almost eliminate the possibility of trouble. This, coupled with accurate and scientifically constructed apparatus at the central office, gives the ideal system. It is often remarked that it requires better line construction for common battery plants, which is true to a certain extent, but any good line will work well with common battery, and in some cases this system is worked on a common return.

Telephone men are beginning to realize the importance of good line construction, especially when they see the great difference in the expense of maintenance between good and bad construction. The Bell Company's plant at St. Louis, in whose employ the writer spent several months in different departments, during the building of the new common battery exchange, offers a good example of first-class construction.

In building this exchange they were extremely particular that every detail was carried out in the best possible manner. It seemed at the time that it was a waste of money, but I have since realized that it was money well invested. The entire system was put in so that it would stand the test of time. The interior wiring was protected in every possible way; 'phones were placed on the wall in the most substantial manner; cable work and line construction was unequaled. As a result the number of cases of trouble per 'phone is less than that of any other telephone exchange in the country. The American Bell Company of Boston have awarded them the credit of giving better service than that given by any other licensed company, and, in the face of the strongest competition, I understand their financial showing is very good, which would not be possible with slighted details and poor construction..

The telephone business stands to-day on a higher plane than ever before. The Independent movement has forced the Bell Company to put forth their best efforts, and this in turn has stimulated the Independent companies, but telephony is yet far from its ideal goal. Look through the operating rooms of some of the large Bell and Independent companies and notice the number of idle operators, while on the same board there are operators that have more calls than they can properly handle. Few telephone men seem to have realized the importance of equalizing the load among the operators, that is, placing enough lines in front of each operator to properly load each position. The accompanying charts, giving the peg count curves, will convey the meaning more readily and show where thousands of dollars can be saved in the cost of operating, by reducing the force, besides giving more efficient service.

The operating force of a large exchange is one of its most important factors. If the operators are well disciplined and courteous, the subscribers are quick to notice and show their appreciation. Even a second or two is noticeable to a subscriber when awaiting an answer from central, and on hearing the operator call "number" in a clear, brisk tone, with a rising inflection, it conveys an idea of discipline; but if the operator answers with a falling inflection and uncertain voice it gives the opposite impression. In fact, the operating force is nearer to the telephone public and wields a greater influence among the telephone users than any other class of individuals connected with the company. It is through the operators that we dispense the little courtesies that make our service popular. A few weeks ago I was examining an Independent telephone exchange which was exceptional, inasmuch as it had over one hundred subscribers, but through the carelessness and neglect of the manager, who lived in another town, in maintaining the 'phones and outside construction the subscriber list had been reduced to twenty-five, and those twenty-five, I am told, remained on account of the courteous treatment they received from the operator, who was certainly exceedingly kind and obliging to subscribers. On the same day I visited this exchange I was in another small city, and while talking over the telephone situation with one of the citizens there he assured me that the chief operator of the Bell Company at that place had done more than any other twenty causes combined to make the Bell Company unpopular. These two cases just cited certainly show the importance of courteous operators. I remember an instance where I reprimanded an operator who had formerly been with the Bell Company for speaking cross to a subscriber; her answer was, "Why, Mr. Stanton, you ought to hear how cross the Bell operators are, and you would not think we were cross."

I prefer not to employ Bell operators. As a general thing they have some undesirable traits which become more prominent when they try to show their importance to the "new company"—as they term it. There is always an army of applicants besieging the telephone company for employment, and if you are a judge of human nature you will not be long in choosing a list of girls, who, with proper training and appreciation of their efforts, will make a very efficient

corps of operators. There are few managers who realize the great advantage derived from the proper training of their operators. As a general thing an operator, after being employed, is given a seat at the switchboard and is told to watch the other operators and learn what she can, and in a short time she commences to answer the calls, and from that time on she is supposed to be an operator. As a matter of fact, she is far from being one. She should become thoroughly familiar with all the rules and should have their meaning explained to her. She should be taught how to handle the plugs with the left hand as well as the right. Until she can use her left hand as easily and naturally as her right she is only half an operator. She should be taught how to answer two or three calls at the same time without interference. It is only in this way that an operator can answer quickly and handle the number of calls she should. Walk through almost any operating room, especially that of an Independent exchange, and notice the number of wooden arms and mallets that are in use, and you will realize that the company is spending unnecessary money. By wooden arms I mean that the operators do not use the left arm any more than if it was wooden; by mallets, I mean that they are driving the plugs in by the heel of the hand, breaking the tinsel of the cords, causing a cut-out which means unsatisfactory service besides the expense of replacing the broken cords. By false motions I mean the plug is picked up with one hand and passed to the other instead of being inserted with the hand by which it is picked up. These are only a few points in which operators should be trained.

The operating room should be conducted on a merit basis and promotions made according to the efficiency and courtesy of the operators. During the month competitive tests should be made to determine the speed and courtesy of operators in answering subscribers, and those having the highest general average as regards speed in responding to calls, courteous treatment of subscribers, obedience to rules, promptness in reporting for duty and regularity of attendance, etc., should receive some sort of promotion. Those whom these tests prove to be unqualified for the position of operator should be discharged. A form of promotion which I have found to work well is to give the operator having the general highest average the most desirable hours, and those least efficient the night hours. Another reward of merit which works well is to recognize the operator's ability by giving her a small raise in wages. I do not believe in giving an operator a large raise of wages at one time, but to encourage them and to show that their efforts are appreciated by giving them an increase of, say, $1 at a time. This may seem like a small amount, but a girl will appreciate this raise as much as a man would an increase of $5 or $10, and by giving a small raise at each time you can reward their efforts more frequently and thus get better results. Another method which I find works admirably is to arrange each operator's merit standing, showing which is first, second, third and so on, leaving a copy in their recreation room. This starts a friendly rivalry among the operators which produces results that cannot fail to make our service popular.

It seems to me operators ought to be rewarded in some such way, if for no other purpose, at least to show their efforts are appreciated.

Every large operating room should be presided over by an A1 telephone man, who is thoroughly acquainted with every detail of the business, and who realizes the necessity of prompt action in the trouble department and the proper disciplining of the operating force. Last, but not least, he should have the faculty of dealing with the telephone public. There is no other business that requires such an endless amount of detail and everlasting vigilance. You are serving a criticising, fault-finding public, who have all whims and fancies imaginable, but who appreciate and are willing to pay for first-class service, and your success is measured by the class of service you give.

ADDRESS OF H. D. CRITCHFIELD.

I want first to thank the president of the convention for making the statement he has just made to you, and while I do not seek to add anything by way of apology, I do regret that I was not in position to prepare a paper upon the subject that was assigned me. However, that was impossible, as it would involve getting much data, dates, names and places which I was not in possession of here, and in no position to become possessed of, and therefore the paper has not been prepared. But in order to fill the program, I will ask your indulgence while I make a few extemporaneous remarks which for the reason before given must necessarily be general in character.

Had I been present at the meeting of the advisory board, which assigned the topics for discussion, I think I should have opposed a paper on this subject for two reasons: First, we don't need much legislation and we don't want any litigation; secondly, if we are forced into either we do not want to advise our opponents in advance, of what we want and what we don't want them to do, and what steps we propose to take in event they do certain things. I say it kindly, but I think a full discussion of this subject would be ill advised.

Now upon legislation there seems to be one topic which is of general interest to many of the gentlemen who are here, and that is legislation affecting right of way on public highways. There seems to be a popular opinion or impression that the legislatures of the respective states have the power by enactment of laws to take from the owners of private property, that property without compensation or due process of law. It seems to be universally held by the courts that the owner of the land abutting on the highway (except in cases where the grant was unconditional, which are rare), is the owner of the soil upon which the road is laid out (the owner of the fee), subject to the right of the public to use the same for purposes of travel. That being true, gentlemen, the provision which is contained in the constitutions of the several states, in effect, that there shall be no taking of private property without due process of law, which means a determination by a court and jury of the value of the property sought to be taken, would prohibit the legislature to do anything other than give to the telephone companies the right of eminent domain, which is conferred upon corporations in almost all states. The legislature has no power, as a general proposition, to do more than to give you the right to put your lines upon the highway, subject to the limitations, however, which have been suggested; that is, if you want to place your poles on the highway you must have the consent of the owner of the property, and also shall so place them as not to impair the highway for the purpose of travel. I think that may be taken as a general proposition to be true, and it is true that there is but one thing to do, and that is to be as diplomatic as you possibly can be in getting your right of way.

Another suggestion which I think is worth while to make is this: Agricultural papers in some sections of the country and demagogues have been advising the farmer to "hold up" these "soulless corporations" and make them pay $10, $25 or $50 a pole if they want to put their line along in front of their farm, and it is very much more difficult to get right of way on the highway now than it was one year ago; it was very much harder to get it last year than it was two years ago, and next year it will be almost impossible. Therefore, get your right of way, and get it just as soon as you can, whether you are going to build this year or not. Determine your lines and get it now before the opposition becomes stronger, because, gentlemen, the courts are holding that there must be compensation where property is taken or injury done thereto.

That being said on the question of legislation, another thing comes, and that is taxation. I am not in favor of the single tax. General taxation laws are usually fair, and there is no reason why, under existing taxation laws, a fair valuation cannot be placed upon telephone property. The

Independent telephone people have one thing to learn. Many of them go upon the theory that their property ought to be placed upon a valuation of about 60 per cent of its cost. Where properties have been recently acquired, the depreciation has been slight, and it is an easy matter to determine what the property cost—there has been no fluctuation in values—therefore they go on the duplicate for about 60 per cent of their cost. This method is three or four times as much in proportion as railroad properties are on the tax duplicate for in the same county. It is three or four times as much in proportion as street railway and electric light properties are placed on the tax duplicate for. While they (Independent telephone properties) are not on the tax duplicate, as a rule, for more than the Bell properties, and while we are not asking to be valued lower than the Bell Company's properties, yet there is no reason why corporations of this kind should be taxed on a larger percentage of their values than other properties referred to, and this is especially true of telephone companies, in view of the fact that they have so materially reduced the rates and afford so much better and more comprehensive service. This, however, is a thing that cannot be taken up by concerted legislation. Nearly all of our states have a commission who fix the valuation of such properties. Some steps should be taken to confer with that commission and arrive at a basis of valuation which is fair, and I think in almost all instances you will find they are willing to do that.

On the question of litigation: A general statement of telephone litigation has been made in the papers recently read here, and it has been referred to in the discussion during this convention. I might say more plainly than has heretofore been said, that the suit brought by the American Bell Telephone Company against the National Telephone Company of Boston, involving the validity of the Berliner patent, would have been lost for the lack of proof and preparation, had it not been for the efforts of the Independent Telephone Association of the United States. In the address of the president yesterday some names were mentioned in giving history in regard to this matter, and while I do not want to be understood as meaning that the president's statement needs vouching for, I have personal knowledge of the correctness thereof. First money was raised, counsel employed, depositions were taken from one end of the country to the other, enormous expenditures were made in that regard, the work was supervised and directed by our worthy president, and but for those persons mentioned by the president yesterday and other unnamed heroes standing with this Association, it would have been impossible to carry on this work. Many of the manufacturers are entitled to credit in this direction, but the thing that brought them together and made it possible to work in unison in that matter was the Independent Telephone Association, through its officers and advisory board. Many say, "What is the use of becoming a member of this Association?" One gentleman here said, "I want to become a member of this Association, but some of our people don't want to become members. It will cost the company $10 membership fee and $15 or $25 in addition. What reason can I give to my company for becoming a member of this Association, for incurring this expense?" The general proposition that it would not have been possible to get throughout this entire land as many men in the Independent telephone business as there are sitting in this hall this morning if it had not been for the efforts directed in this regard, is sufficient answer to this question. And the further objection has been made that the money that was sought to be raised was for the purpose of providing good salaries for certain gentlemen who were interested in pushing this matter. I want to say to you that not one single, solitary dollar of salary has ever been paid to any officer of this Association, except to one man, one year a treasurer of this organization, who came from the South, and kept his salary out and let the expense accounts go. Not one dollar of salary has been paid, not one dollar of salary is charged up against this Association. Officers of the Association, members of the advisory board and friends of the Association have gone out and done this work, notwithstanding the fact that at the same time they were charged with impure motives. That is a fact, and those gentlemen who made such charges have met the fate—I say it not unkindly, because I pity them—have met the fate of all men who try to climb by pulling others down, repudiated by honest men or buried in oblivion.

This work is not completed yet, new work is to be done, or, rather, the same lines are to be further pursued. I am not asking for money. You gentlemen who are here are, so far as I know, all members of this organization. If you are not and are not contributing your fair proportion or will not after your understanding of the matter, you are acting differently than you would in your private business affairs or social matters. If you were going out in the evening to dinner, and after that to the theater, and after that to a little lunch, and do this day after day and week after week, you would divide that expense up. There is not one of you who would be willing to put it all on the willing horse. Now I think you are all doing the other thing. If you are not, see if you are not in the position I suggest, and see, gentlemen, if you would not go into a social matter in this other way, and it is the same thing. But the principal thing I want to suggest in this regard is this, when you meet others, not members, but who ought to be, see if you cannot induce them to see the error of their ways. It is a very small matter; it has been said time and time again that two cents per telephone was too much to pay as dues. If every one of the telephones and every one of the miles of pole lines used for toll purposes would pay two cents and would send it to the treasurer, and not compel the secretary to spend one-half to get the other half, it would be sufficient to pay the expenses of the Association, but they don't do it. It's a rule in organizations of all kinds that a few have to bear the burdens. It is a rule that always will prevail, and which has prevailed in this case, but it excuses no one from contributing his mite. Never lose sight of the main proposition before stated which is so big, that, as the sun, you lose consciousness of its location, you simply know that it is light. The fact that your very life to-day depends upon what has already been done by the Independent Telephone Association ought to entitle the organizations, without personality, to your everlasting gratitude. Where would you gentlemen have been who have gone into the telephone business in the last three years if somebody had not assured you that all would be well in the suit that was commenced in 1895. You had a comfortable feeling that the National Telephone Association had taken up the defense of the Berliner case and you felt way down in your heart that you would be taken care of. Push the Association along.

Just one thing further, and I have done, and that is the plan spoken of in Mr. Fisher's paper, which has been adopted by the Bell licensee companies in many instances. It has been said that the condition on which Mr. Fish accepted the presidency of the American Telephone & Telegraph Company was that the policy of the company should be so changed as that connection might be made between the Bell companies and Independent properties, where the independent companies had the best of the situation. Now that seems to be the thing that we all thought would ultimately come, and the wonder to us is that it did not come long ago, but the Bell people in this instance have done what in my judgment they do in all instances. Give them enough rope and let them alone long enough and they will do wrong or will fail to do that which is right within the right time. I don't mean to underestimate the strength of the opposition, I want to impress upon you that it is a good deal hotter now, that it is in better shape to give us "a run for our money" now than it has ever been before, but we are in shape to get our money's worth; but it is yet unfinished, we have yet to be vigilant and watchful.

I might refer to one thing in the state of Indiana, where our esteemed secretary, Mr. Hugh Dougherty, and

other good Hoosiers live. The Bell Company, owing to local influence, could not get franchises in many of the places where Independent companies had established plants. They went to the legislature, and, under cover of a very specious title, sought to have a bill passed giving them a franchise in all towns and villages in Indiana having less than 15,000 population. Through vigilance, business sense and acquaintance with politics, "the gentlemen from Indiana" (and I believe I am not doing a wrong if I give full credit to Hugh Daugherty), found out what was going on and sent word out to the boys to kill the bill, and it was killed.

All you have got to do, gentlemen, is to stand together; we can always count on some fellow finding out what is going on, and it won't take long to prevent it. No injurious legislation can be passed in any one of half of these United States if the Independent telephone people unite in opposing it. I believe we do not need much affirmative legislation, but we must see that we are not legislated against, and we must look with scrutiny upon all bills introduced into the several legislatures. Someone in each state ought to be charged with the duty of inspecting all measures introduced, examining them with a view of the possible effect on telephone business, and if they are undesirable pass the word down the line. We must stand together. You have men in every Independent telephone company who are closely identified with the political and business affairs, and who stand high in the community's regard. These men organized, these men in touch with each other throughout any county, state or nation, can accomplish all that is necessary to accomplish if their action is uniform and intelligent. Let us stand together all the time. If this policy advocated by the Bell management should ever be pushed, let us say, as we have said in the past, let us do as we have done in the past—whip them, and after they are whipped make terms, and when terms are made make the terms for all, and the man who sells out, not only his property, but his friends, after standing shoulder to shoulder in this sort of a controversy, is unworthy the confidence we have placed in him by admitting him to our friendship. There is no occasion for any individual to quit, there is no reason why any new policy need be feared if we but do our duty. The last statement made by the president of the allied Bell companies shows that they have less than 1,000,000 telephones in this country after twenty-seven years. The best information that can be gotten is, that the Independents, beginning in 1895, have got more than a million and a half of telephones, and each year has showed more and more and more telephones installed than were installed the year next preceding. There is no reason why the more than fifty thousand stockholders in Independent telephone companies of this country, standing together, cannot dictate the telephone situation. Is there any reason why they cannot? They never asked anything unfair; they don't intend to ask anything unfair, but they want a fair show, and they intend to have it. I thank you.

E. B. FISHER'S PAPER.

I do not expect or hope to say anything new or novel. Most of you already know all that I shall say this morning; have had experiences and observations similar to those which I will mention; but to recall them may induce the presentation of other and really new experiences, and may prove an encouragement or a suggestion to those just entering, or about to enter, the Independent telephone field.

The man or corporation that ignores competitors, that fails to study their mutual conditions and profit from them, could not expect to succeed in competitive enterprises and efforts. The man or corporation that maliciously or falsely discusses the competitor and its business, in the hope that thereby his own business may be benefited, makes a grievous mistake, and in the end loses more than is expected to be gained. With these two thoughts as premises, I enter upon a discussion of Bell methods. I could not, under any circumstances, consider such a topic in the spirit of criticism only; and were I expected to do so, should certainly decline the assignment. The gentlemen who have been conducting the business of the various constituents of what we know as the Bell company are our neighbors and friends. Many of them have been in the telephone business for years, some for quite twenty years. They have extended experience; they are competent, successful business men, and we can learn much by observing their methods, and undoubtedly can find many examples in their conduct of business from which to profit.

One of the most serious criticisms I have had occasion to suggest as to Independent telephone companies is their lack of system, their lack of carefully analyzing conditions and experiences, and their making systematic deductions therefrom. They have engaged in the telephone business, in too many cases, much as the original Bell corporation did, and have been learning from sad personal experiences rather than from profitable observation of what had already been "threshed out" in the evolution of the Bell system. It is highly essential, now that the Independent systems are becoming larger, more complex and intimately related with each other, that thorough system shall obtain; that first-class construction shall be the rule rather than the exception; that uniformity of practice in the matter of toll service and in the division of revenue arising therefrom shall obtain; that those conducting the business shall exchange experiences, thus enabling all to learn of mistakes and avoid them, and to secure the advantages of improvements that may be devised. The exchanges of the Bell company throughout the country have for years enjoyed this interchange of opinion and experience, and through the manifest advantages of such interchange have avoided many difficulties and secured many betterments. We can, and should, copy this feature. We should meet each other frequently, individually and collectively; should keep in touch with each other by correspondence as well as over the wires. When we hear of a good thing let our neighbors know of it; when we discover perils or uncomfortable conditions, warn our friends. The Bell, in a sense, although composed of many subordinate companies, have been one family. We can retain our individuality, maintain our ambitions to be the first in our chosen sphere of action, and still remember that we are a part of a family. Some have been inclined to suggest that our friends of the Bell company had too much system. As the business develops it begins to appear that too much system is less expensive and less foolish than too little. If the managers and operators of Independent plants shall more carefully and fully analyze the cost of conducting the business in the different departments and the results therefrom, many errors will be avoided and the ledger balance on the right side will unquestionably grow. In systematizing business we have much to learn from Bell methods. We should gain by this knowledge and improve on it.

There are directions, as we believe, in which our neighbors are still in error. What shall be said this morning, the statements or conclusions derived therefrom, should be received as they are intended, wholly in the nature of suggestion and warning for ourselves, rather than of criticism of, or fault finding with, the aforesaid neighbors. It is undoubtedly true that the conduct of a monopoly often results in somewhat of arrogance on the part of those who are at the head of such monopoly, or who hold responsible positions in the management of its business. Such people naturally come to feel that they can do about as they please, and if patrons or the public are not delighted therewith, what odds? I have heard gentlemen, who are listeners to this paper, more than once offer this suggestion that they would not care for the service of certain Bell employes who had applied for positions, because they were too "cranky." We can see for ourselves how natural it was that crankiness grew upon many officials and managers of Bell plants. They were not obliged to consult the wishes

or desires of the public to secure their business and profits. One could take telephone service on their terms or let it alone. That was all there was of it.

This spirit of crankiness, so natural under the circumstances which engendered it, is the outgrowth of natural conditions which produce other peculiar manifestations, often noted during the past few years. We should carefully consider these manifestations which are intended or expected to affect our own business, and by interchange of observation or experiences help each other, and counsel or warn those who are about to engage in Independent telephone business. I well remember, a little more than six years ago, when we began canvassing in Grand Rapids, Mich., to secure the moneys with which to build the plant of the Citizens' company, and for patrons of the same, the many stories which were afloat among our people as to our business. It was confidently asserted by representatives of the Bell company in our city and state that we never would build a telephone plant; indeed, that we had no intention of so doing, and were only trying to make money by being bought out. We were, in effect, it was intimated, intending blackmail. It was said that we could not build; could not get material; could not properly combine the material when we got it; could not find apparatus that was not infringing; could not get a switchboard that would work; would not know enough to set poles, to string wire thereon and make them stand up. Even after we had actually begun to install telephones, those who had given us contracts were prompted to bet that we would never give service. There were infringement suits which may have been really expected to put a quietus on our enterprise, but none of them succeeded. It scarcely seems possible that some of them could have been expected to.

We have been giving service for more than five years, and the company which was then organized with but $100,000 authorized capital has grown until it has to-day in service more than one-half as many telephones as the Bell had in the entire state of Michigan but five years ago, and has an authorized capital well toward one-half of what the Michigan company then had. And yet to-day similar predictions and commentaries upon like enterprises even in Michigan as well as in other states are indulged in by our neighbors. Officials of the Erie company have informed the public through the press within a few weeks that the new Independent plant will never be built in Detroit; that the People's company in that city will never give service. When, in your respective localities, the Bell resorts to such methods to dissuade the public from patronizing them, to persuade them that you are not intending genuine business, you can comfort yourself with the fact that you are not singular in this experience, and you can point to results in other localities, and say to your friends, "It is an old story, and no truer here than it has been elsewhere."

If you get started with service and you find that your patrons receive circular letters suggesting that the Bell is owner of letters patent "steen hundred thousand and steen," and that all who use the Independent apparatus infringe such letters patent and are liable to prosecution for using the same, do not flatter yourself that in this method the Bell company is distinguishing you beyond other Independent companies. Such things have been done repeatedly. You have yet to hear of a subscriber who has been so prosecuted and you can very safely guarantee your patrons against any damage that may be awarded by any court under such suits, and that you will pay all costs for defense. If you should find that the Bell company, which has frequently informed the people in your community that their former rates were the lowest they could afford to make for their service in your community, has, upon the development of your competition, resorted to free service or much less than cost rates in an effort to destroy you, do not be fearful that such practice can really damage your company; do not imagine that you are enduring an experience novel in the telephone business. Do not, for a minute, when the Bell resorts to this method, attempt to meet competition by establishing like rates or lower rates for your own service. Begin the education of your people; take them into your confidence; tell them the truth about your business and its results; insist upon a fair profit, upon reasonable returns upon the actual investment after giving good service, and you will find the people ready to pay your price rather than to get absolutely free service from your competitor. Do not resort to other tactics because there can be but one result from such procedure. The Bell method is a "war measure" pure and simple, and if it could succeed would be followed by such advance in rates as would fully compensate that company for the temporary concession of free service or less-than-cost rates. This fact has but to be stated to intelligent business men to be apparent to them and to influence their actions. This method, which has been practiced by the Bell subordinate companies in considerable regions of the country, so far as I know never yet has succeeded in taking away the patronage of an Independent company honestly striving to give good service at a reasonable rate. The company which shall reduce its rates below a reasonable point in the struggle with the Bell company is doomed the moment it shall do so.

What do you think of party line service? One of the methods of the Bell company in its efforts to meet the lower rates of Independent telephone companies has been to introduce, quite largely, party line service with important reductions in rates for such service. Has it been successful where you have observed it? Is it a serious menace as a competitor? Of course, we know that the new president of the Central Union and the Chicago telephone companies, who still retains his position at the head of the Pacific Coast Company —all Bell—is a stanch advocate of this sort of service. He is a gentleman of extended experience and wide observation in telephony, and for that reason his opinion is not to be lightly dismissed or treated with indifference. We are this morning discussing Bell methods in the hope that we may learn from them and profit from either accepting or avoiding their example. My own observation has been that party line service is largely "a snare and a delusion" where given in city exchanges, and is not a competition that we need fear. It is evident that no devices have yet been invented which will permit more than two parties to use the line at the same time, so when any pair on a party line holds the line, others must wait. Should this sort of service be generally used, the difficulty of securing your own line and of getting connection with other parties on similar lines is manifestly very greatly increased. We all know how impatient the average telephone user is to get service the moment it is wished. You have known subscribers ready to swear that the girl kept them waiting two minutes for a connection when it was not to exceed twenty seconds. I do not believe that you will be compelled to resort to party line service to meet this method of the Bell competition. The B. W. C. service which was expected to work wonders three or four years ago is not very generally popular.

No discussion of recent Bell methods would be useful if we did not consider minute rates for toll service. What is your observation on this topic? The high authority from the Pacific Coast who is trying to stifle competitors in the Central Union territory and to prevent it in Chicago, who is indeed regarded as a possible head of the American Telephone and Telegraph Company, is the father of the minute rate service. He sets great store by his scheme and has secured its adoption in considerable territory outside of that which he controls. We, in the Michigan territory, find it one of our competitions, and have not quite made up our minds as to its present and probable effects. However, on general terms, it is fair to state that it is causing considerable friction and dissatisfaction. The average telephone user is ready to affirm that he has not used the service as long as he has been charged for. He considers himself a victim of overcharge and believes that the minute rate is

intended to thus increase the fees of the telephone company, which he was inclined to believe are already quite large enough. If the average business man, on a long distance connection, can actually accomplish his conversation in a single minute, it strikes me that at the price for one minute connection the line cannot earn enough; for we all know that quite as much time as heretofore has been spent in getting two parties to talking as is occupied with their conversation. Now, if the time for securing connections cannot be reduced and the time of using is reduced, with theoretical reduction of pay, service would be less profitable to the companies on the three or the five minute basis. If the average subscriber is expected to use the line on a three or five minute basis, why not make rates upon that theory? That would be fair to both company and patron and secure the desired revenue even if but one minute should actually be used. The purpose of this paper, as before indicated, is to set you to talking about your mutual experiences and to induce discussion rather than to state conclusions.

In Michigan our neighbors have taken a new departure within the last few weeks. Formerly they refused to admit that any other apparatus than the Bell could be successfully used in telephone service. The sub-companies of the parent company were supposed to have a hard and fast contract forbidding the use of any other apparatus and forbidding connections with any other apparatus. Latterly the Michigan Telephone Company have been attempting to secure, in a few instances, toll line alliances with companies formerly built and still continued, as far as exchanges are concerned, as Independent companies. The Michigan company has said in effect to such companies: Keep your local exchanges, even your own toll lines, take control of the exchange business in your locality, but enter into a contract for toll connection outside your territory through the Bell system; it will give you equal percentages on originating business to those you have heretofore enjoyed and provide you with more extended and superior toll line facilities. This late Bell method is insidious and it is not strange that in some cases it is successful. Where such a contract is made exclusive—and of course they try to make it exclusive if possible—it subtracts by so much from the efficiency of adjoining or neighboring Independent service. So anxious has the Michigan Telephone Company become in this matter, I believe it is true that it has been willing to make arrangements in some cases for a divided toll service where it was impossible to secure an exclusive contract. This Bell method is one of the most threatening efforts yet made, and yet has its silver lining. The strong Independent companies, with considerable toll line facilities which have been growing, have not been influenced by such propositions. Only the smaller and weaker companies have made such contracts with the Bell company. Of course no other Independent company has been willing to parallel the lines of another Independent company, no matter how inferior might be that neighboring plant or how imperfect its service. Now that sort of territory will be provided with up-to-date Independent plants. This recent manifestation would seem to indicate that the parent company must have consented to an abandonment of the exclusive feature of its contract with subordinate companies.

I believe that the Bell habit of ignoring the farmers—the small villages and the country—has been an error. I think that in this department of telephone service a proper development of party lines may be made with great advantage to the communities served and with fair profits to the investor. There are regions in Michigan—and probably each of you could repeat the same tale—where the Bell is beginning to compete with Independents in their own field in this regard. I say their own field, because the Independents were the first to deliberately provide this sort of service. This Bell method of following a good example may prove a formidable competition and may materially strengthen their smaller exchanges and their situation if they shall first enter new territory with this sort of service.

There was a time when I think it was actually believed by the average general manager or prominent official connected with the Bell company that an Independent company could not possibly secure intelligent, experienced employes. They thought that we would be compelled to go through the process of evolution which was so tedious and costly in the earlier days of the Bell company; that their employes would remain with them. They even thought in some localities that an Independent company could not get exchange operators, and in some instances employed superfluous help simply to keep them from entering the service of Independent competitors. Some know more to-day on this topic than they did a few years ago. A large number of the brightest men in telephony have found employment in the Independent field, and there is scarcely one in this convention hall who has not had frequent opportunity to secure many more of the most important employes of the Bell company than he had places for. We have been surprised at times at the seeming lack of loyalty to their employers by those who have been so long on Bell pay rolls. Perhaps a little analysis of Bell methods may explain this situation and furnish a warning for ourselves. The rewards among the employes of the Bell heretofore have not been great either in salary or in opportunities. They have been made to feel more like machines than human beings. In many cases they have not had their inventive tendencies encouraged by proper compensation for what they produced; indeed, they have been compelled to part with their inventions on the theory that their brains as well as their labor belonged to their employer; or because there was but one market for their invention and devices, that are not conducive to loyalty or to inducing energetic service. The Independents, if they shall copy Bell methods in this respect, will make a grievous mistake.

If you should wake up some fine morning and hear that you have sold or are about to sell your telephone plant to the Bell company do not consider that the transaction is necessarily closed. If you hear similar reports as to actual or impending sales of other Independent companies in your own state or other states, be not disturbed thereat nor convinced that the news is reliable. There have been some such sales, but vastly more rumors of those that never have occurred and do not seem likely to. There have been methods in these rumors. For some reason some interests, evidently not Independent, has believed it desirable to circulate such reports, probably in the hope that other Independent interests might be disquieted or discouraged, and yield more readily to apparent more advantageous offers. These methods have been relied upon to produce serious effects. Keep yourself and your neighbors advised of the strength and growth of the Independent movement, of the strength of their own situation in competition, and fewer such rumors will be circulated in the future and fewer still be verified by any actual sale of Independent systems or interests.

In nothing that I have said thus far have I given many of you real news. As I said to one of my friends, I felt that it was impossible to do so, and was almost ashamed for having tried to prepare and read such a paper; but if it shall refresh your memory; if it shall induce you to give other experiences and observations of your own; if it shall attract, through publication in our annual reports or otherwise, the attention of any who are about to engage in telephone business, and shall hearten and strengthen them in their enterprise and efforts, it may accomplish some of the good earnestly desired and intended in the preparation of the paper. As stated at the outset, it is not in criticism or derogation of the Bell company that it is offered. That corporation has the right to resort to any efforts, within the bound of facts, it may choose to make, and we have equal rights to discuss its methods, and by considering them minimize their effect, if not entirely to overcome them. It is in this spirit of consideration only that this paper is offered.

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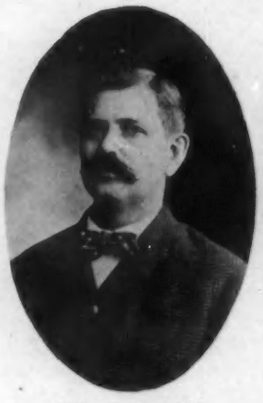

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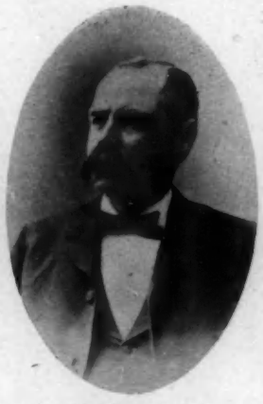

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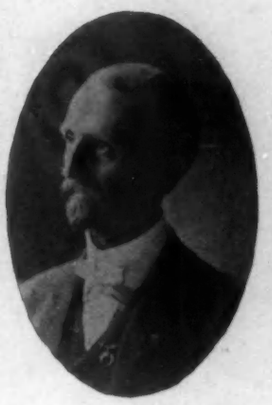

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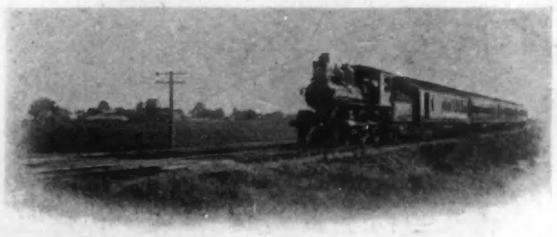
Smith, H. L., Cortland Home Telephone Company, Cortland, N. Y.
Stanton, L. W., Cuyahoga Telephone Company, Cleveland, Ohio.
Snyder, J. D., Findlay, Ohio.
Steinson, C. E., Rochester Telephone Company, Rochester, N. Y.
Speed, J. J., American Electric Telephone Company, Chicago, Ill.
Stevens, Chas. G., Chicago, Ill.
Stein, Arthur, Eureka Electric Company, Chicago, Ill.
Stiger, C. W., Stromberg-Carlson Telephone Manufacturing Company, Chicago, Ill.
Steele, Geo. C., North Electric Company, Cleveland, O.
Stoops, Claude R., Nappanee, Ind.
Stromberg, Alfred, Stromberg-Carlson Telephone Manufacturing Company, Chicago, Ill.
Stratton, J. A., Williams Electric Company, Cleveland, Ohio.
Strong, S. M., Akron People's Telephone Company, Akron, Ohio.
Stillings, L. A., Clark Automatic Telephone Switchboard Company, Providence, R. I.
Swan, C. W., New York, N. Y.
Taylor, N. K., Federal Telephone Company, Cleveland, Ohio.
Townsend, W. W., Kellogg Switchboard & Supply Company, Chicago, Ill.
Taylor, F. G., Findlay, Ohio.
Taylor, A. M., Cleveland, Ohio.
Taylor, H. A., Lafayette Telephone Company, Lafayette, Ind.
Tingley, T. A., John A. Roebling's Sons Company, Trenton, N. J.
Trier, Geo. F., National Telephone & Telegraph Company, Ft. Wayne, Ind.
Vernier, A. J., Harrison County Telephone Company, Cadiz, Ohio.
Viggars, Chas. H., Automatic Telephone Meter Company, Boston, Mass.
Ware, J. B., People's Telephone Company, Detroit, Mich.
Walker, Edward T., Boston, Mass.
Walker, M. S., F. Bissell Company, Toledo, Ohio.
Warner, T. W., and wife, Warren Electric Company, Muncie, Ind.
Wagner, John E., Stromberg-Carlson Telephone Manufacturing Company, Chicago, Ill.
Watson, W. J., New York Agent American Electrical Works, Providence, R. I.
Wilhelm, Walter L., Wilhelm Telephone Manufacturing Company, Buffalo, N. Y.
Weil, Samuel, Youngstown Telephone Company, Youngstown, Ohio.
Whitney, A. A., Morrow County Telephone Company, Mount Gilead, Ohio.
Wiley, J. R., Standard Underground Cable Company, Chicago, Ill.
Watrous, R. B., Milwaukee, Wis.
Wiley, G. L., Standard Uunderground Cable Company, New York. N. Y.
Wilcox, F. W., General Electric Company, Harrison, N. Y.
Woodbury, W. B., Federal Telephone Company, Cleveland, Ohio.
Williams, J. A., Williams Electric Company, Cleveland, Ohio.
Willis, C. E., Stromberg-Carlson Telephone Manufacturing Company, Chicago, Ill.
Woodman, H. E., Burlington County Telephone Company, Mount Holly, N. J.
Worstall, A. M., Interstate Telephone Company, Philadelphia, Pa.
Young, H. C., Columbia Telephone Company, Columbia, Pa.
Zwerner, Geo. P., Marysville Telephone Company, Marysville, Ohio.
Zuver, Minnie E., Federal Telephone Company, Cleveland, Ohio.



TELEPHONY'S SPECIAL TRAIN TO BUFFALO CONVENTION.

FALL RIVER AUTOMATIC TELEPHONE COMPANY.

The annual meeting of the Fall River Automatic Telephone Company was held May 27 in the company's new Exchange Building on Bank street, Fall River, Mass., and the following board of directors were selected: B. D. Davol, E. B. Jennings, R. P. Borden, C. S. Greene, R. J. Thompson, V. A. Sears, R. F. Haffenreffer, J. W. Coughlin, M. Sweeney. B. D. Davol, treasurer; R. P. Borden, clerk.

The company has very nearly completed its plant with its underground system, designed for 3,000 subscribers on private lines exclusively. The automatic switchboards furnished by the Strowger Automatic Telephone Exchange of Chicago have arrived and are being connected up. The exchange will open for business in July and will be the largest automatic telephone exchange at that date in the world. The population of Fall River is 104,000.

WELL-KNOWN HEADS OF WELL-KNOWN HOUSES.

Milo G. Kellogg, the head of the Kellogg Switchboard and Supply Company, is probably the man in the Independent telephone business who first placed himself in opposition to the Bell telephone monopoly. He has been actively interested in the telephone business from the time of the invention and introduction of the telephone, about twenty-five years ago, and as early as the year 1878, two years after the telephone was invented, he was in opposition to the Bell company.

Mr. Kellogg entered the electrical business in the year 1870, when he entered the employ of the firm of Gray &

MILO G. KELLOGG.

Barton, who were then important manufacturers of electrical instruments in Chicago. Mr. Gray of the firm was the noted inventor, Elisha Gray, whose reputation afterward became world-wide, and Mr. Barton was Enos M. Barton, who for many years has been president of the Western Electric Company. General Anson Stager, then general superintendent of the Western Union Telegraph Company and afterward vice-president of that company and president of the Western Electric Company, the Chicago Telephone Company and the Central Union Telephone Company, was also a member of the firm.

In the year 1872 the Western Electric Manufacturing Company was organized with the above named gentlemen as officers of the company and Mr. Kellogg as the cashier and the owner of a considerable stock interest. The Western Union Telegraph Company was then also a large stockholder in the company. When Mr. Gray became deeply interested in his telephonic inventions about the year 1875, Mr. Kellogg succeeded him as the superintendent of the company and held that position for about ten years. In the year 1878 the Western Union Telegraph Company became active opponents to the Bell company, having obtained the telephone patents and inventions of Mr. Gray and of Thomas A. Edison, and for about two years afterward the Western Electric Manufacturing Company, under Mr. Kellogg's superintendence, manufactured most of the telephones and other apparatus for the Western Union interests. In November, 1879, the famous contract between the Western Union and the Bell companies was entered into, which existed for seventeen years, and by which neither company was to enter upon the business of the other. The Western Union was to receive 20 per cent of the gross receipts of the Bell company and the Bell company was to own and control all the telephone patents of both companies. By this arrangement the Western Electric Company lost the right and the opportunity to do manufacturing for the combined interest, and the Bell company licensed others as manufacturers under its patents, but refused a license to the Western Electric Manufacturing Company. Thereupon the latter company, in January, 1880, under Mr. Kellogg's initiation and guidance began the policy of securing for themselves a large number of new patents and inventions in telephony and entered upon an active competition with the Bell company's licensed manufacturers of telephone appliances, and was preparing to enter upon an active competition to the Bell company itself. During that period it obtained numerous valuable patents, including all the fundamental patents on multiple switchboards. It also obtained control of the inventions of J. H. Irwin and William Voelker, whose applications were in interference with Bell, Edison and Gray in the patent office and who claimed priority of the invention of the Microphone over Berliner.

In the year 1882 the Bell company, in order to forestall this growing and threatening opposition, secured the control of the majority of the Western Electric Manufacturing Company's stock, which was then comparatively easy to do, as the Western Union Telegraph Company owned one-third of the stock, which it sold to the Bell company. The present Western Electric Company was then formed by the combination of the old company with the licensed manufacturers of the Bell company and with the Bell company in the control. Mr. Kellogg remained as superintendent of this new Western Electric Company until the year 1885, when he retired from active connection with the same, not liking the policy and control of the Bell company. From that time he began making and patenting a series of telephone inventions of his own, which work extended over a period of about twelve years and which culminated in the issue of 125 patents to him on October 17, 1897, besides over twenty-five which had previously been issued to him. He did this because he foresaw that the policy of the Bell company toward the public and its licenses was such that competition must eventually come, on the expiration of the fundamental Bell patents, and that then there would be a value in competing telephone systems and apparatus.

In the year 1891 the famous Berliner patent was issued to the Bell company, the application for which had been quietly pending for fourteen years in the patent office. Mr. Kellogg at once saw that this patent, if unchallenged, would deter telephone competition for seventeen years longer and make his own inventions and the work of ten or twelve years with considerable expenditures, practically valueless, because it would prevent a market for the same. Being of an ingenious turn of mind, he conceived the plan of forestalling this result, and at the same time give the public the practical benefits of telephone competition. His plan was to obtain the action of the Government itself to bring a suit to cancel or withdraw the patent on the ground that it had been unlawfully issued. He succeeded after considerable effort in having the suit brought in 1893 by Attorney General Miller of President Harrison's administration. Arrayed against him in this effort was the influence of the Commissioner of Patents and of other officials of the Patent office, who had caused the patent to issue. The question of bringing the suit had the consideration of President Harrison himself, as

well as of the Attorney General, the Secretary of the Interior and other cabinet officers. The case when brought, was prosecuted by the Government under direction of the Attorney General of Cleveland's second administration, and although the Supreme Court of the United States decided that there was no proof of actual fraud, and that a patent could be only canceled for fraud, yet Judge Carpenter in the District Court of Massachusetts had decided in the case that the patent was invalid on another ground which would be a good defense in an infringement suit. From the time of Judge Carpenter's decision the patent has not been respected, while before that the public refrained from using battery transmitters. From this decision of Judge Carpenter, therefore, began the present Independent telephone competition, and to Mr. Kellogg is due the inception of the suit, which brought about that decision. Mr. Kellogg, therefore, is the father of the action which brought on the modern Independent telephone movement.

Mr. Kellogg was also influential in making valueless another Bell patent which the company for several years advertised as being fundamental to all battery transmitters, but the mention of which has for some time been withdrawn from its advertisements. This is the Edison carbon patent, which was issued in 1893, after having been in the patent office for about fourteen years. It depended upon a certain interpretation of the patent laws whether this patent had already expired by reason of foreign patenting, or whether the patent was to run for seventeen years from its issue. There was a test case in the Supreme Court involving this issue. Mr. Storrow, who was for so many years the great counsel of the Bell company, filed a brief in the case which was in support of the Bell continuation. Mr. Kellogg employed ex-Solicitor General Aldrich to file another brief for the opposite contention. The Supreme Court decided the case on the lines of Mr. Aldrich's contention and the Edison patent was from that time considered as invalid.

While this suit was pending in the Supreme Court, bills were introduced and were pending in Congress to change the patent law in such a way as to extend the Edison patent until the year 1910. Mr. Kellogg forestalled such action by employing Mr. Aldrich to prepare and send a memorial to all members of Congress which exposed the true intent of the bills, and they were thereupon dropped by those who had them in charge. Mr. Kellogg was thus again the instrument in making the present telephone competition possible.

Mr. Kellogg has had several important suits against the Bell Telephone Company and its allied interests. One was against that company and the Great Southern Telephone Company which involved the rights of a majority stockholder to manage a company in its own interest and against the interests of minority stockholders. While this suit was pending there was a proposition to consolidate the Great Southern Company with the Cumberland Telephone Company (both Bell license companies), which Mr. Kellogg consented to as a stockholder in the Great Southern Company, which practically dismissed his suit. He has since disposed of his interest in the consolidated company.

Mr. Kellogg also had a suit against the officers of the Central Union Telephone Company (the licensee of the Bell company) to compel them to allow him as a stockholder and a director to inspect the books of the company. This suit was decided in his favor by the Supreme Court of Illinois, which clearly defined such rights of a stockholder and director. Having obtained the decision he did not insist upon his rights, but resigned as a director.

He also has had a suit against the Western Electric Company for the payment of the value of his patent on multiple switchboards, which he had assigned to the company, asking and expecting payment therefor. This patent was the most valuable of its multiple switchboard patents. The company took advantage of the statutes of limitations to contest the payment, and therefore obtained the use and protection of the patent for its life without any payment whatever therefor.

Mr. Kellogg has been a prolific inventor of telephone apparatus. His earliest invention was that of the multiple switchboard mentioned above, which was made in the year 1879 and was patented in November, 1884.

Another of his inventions was that of the Standard switchboard of the Western Electric Company. This switchboard was also invented in the year 1879 and was patented in 1881. It is the switchboard which has been in use in practically all Bell exchanges which do not employ multiple switchboards and which in the Independent field is called the Bell type board. His original inventions therefor practically cover all the switchboards which have been used by the Bell company, as well as most of those used by the Independent companies; that is, most of those used by the latter companies which are not transfer switchboards.

ILLUSTRATED COURSE IN TELEPHONY.

CONDUCTED BY W. A. TAYLOR, M. E.

Telephone Troubles and Their Remedies.

Before taking up the subject of trouble on common battery, or, as it is frequently called, central energy systems, it might be well to explain the various different types now commonly used, so as to show their method of operation. There are a number of different systems in use throughout the country, some of which are modifications of the same thing, but there are but two kinds in general usage, one of which makes use of repeating coils for the transmission of the voice current from one line to the other, and the other system uses impedance or retardation coils for

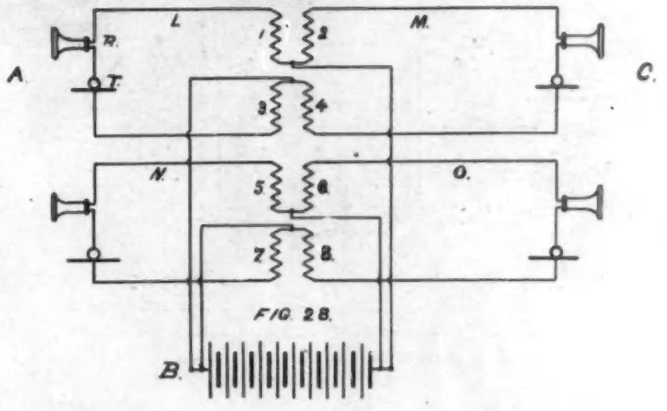


FIG. 28.

the same purpose. Figure 28 shows the simple diagram for the circuit using the repeating coils. The system is known as the Hayes system. The repeating coil has four windings, represented by 1, 2, 3 and 4, with the battery B connected in the repeating coil circuits. This battery is, of course, used by all the lines in the exchange. The arrangement is the same as if the middle of each half of an ordinary repeating coil were open and the battery inserted. In order to balance the lines, however, each winding should have exactly the same number of turns and the resistance of the sum of 1 and 3 should equal the combined resistance of 2 and 4. Let us suppose that subscriber A is connected with subscriber B. It is evident that current from the battery will flow out through the coils of the repeating coil, out over the lines 4 and M, and through the telephone sets A and C. Every change in the resistance of line 4 will change the amount of current in that line, and consequently the magnetism in the core of the induction coil. The result, then, of the rapidly changing resistance due to a transmitter T will cause a change in the current of the line and a consequent change of the magnetism of the repeating coil core. This changing magnetism in turn induces a current in the windings 2 and 4, which flows over the line M, affecting the diaphragm of C's receiver. It may be asked why are not the other cir-

cuits affected by this same current? Suppose A was talking to C, why should not subscribers on the lines N and O hear what is said? The reason is that in the first place the battery B has so low an internal resistance that practically all the talking current is short-circuited through it. What amount may be shunted away from the battery, due to its resistance, is choked back by the impedance of the coils 5, 6, 7 and 8 of the repeating coil in the circuits N and O. In a properly designed exchange of this kind there is no cross-talk between the circuits, due to resistance in the battery circuits. In some of the larger exchanges the leads from the battery are made exceedingly large, to cut down any possibility of cross-talk. In one case at least they consist of copper bars with a cross section of six inches by one-half inch. In all cases except the small exchanges storage batteries are used as the source of energy, because of their low resistance and high current capacity. In a number of small exchanges a type of primary cell with a very low internal resistance is used. These cells give very fair satisfaction where the current consumption is small, and while there is a trifling amount of cross-talk it is not enough to notice unless it is especially sought for.

The repeating coil used in this system is of special design, and in the case of the Bell Company consists of about 3,300 turns of wire for each of the four windings. The repeating coil should be connected, according to the same

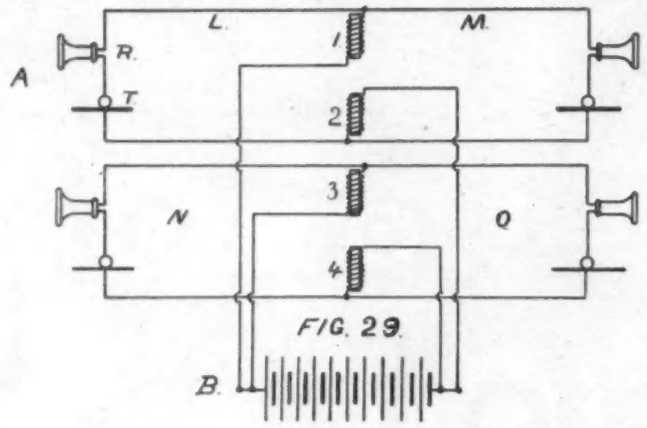


FIG. 29.

authority, so that the winding of one-half is opposed to that of the other half. That is so that the normal flow of current in the one-half neutralizes the magnetism produced by the current flowing in the other half. The idea is to make the inductive effect of telephonic currents greater because of the lower magnetic density in the core. There is one drawback to this method, however, and that is when the windings are thus opposed to each other the impedance to outside telephonic currents is also lowered, making the tendency to cross-talk greater. It is very doubtful that the magnetism approaches anywhere near saturation in any repeating coil where the coils are not opposed, at any rate their effect would only be noticed on very short lines, and as the transmission is good anywhere on such lines there could be no harm done by having them not opposed. On very long lines the magnetism of the core would be lower and no trouble experienced. Therefore, it is probably better, as it will save copper in the battery circuit and also save the danger of cross-talk to have the windings of the repeating coil so connected that they act magnetically in the same direction. There are a number of very large exchanges in this country where all the repeating coils are connected, so as to produce a neutral field, as far as possible.

As to the system in which retardation coils are used, Fig. 29 shows a typical example; this circuit is what is commonly known as the Stone system. B represents a battery of suitable type; 1 and 2 are impedance or retardation coils; A and C are the subscribers' stations. When A talks to C the changes in the resistance causes the current to fluctuate in the receiver of C, in the following manner: Suppose that the line circuit 4 measures 50 ohms—line circuit M also 50 ohms—the two impedance coils 50 ohms each and each of the subscribers' circuits 50 ohms when not excited. In this condition there would be 150 ohms in the circuit, and if the battery was 20 volts, the entire current would be .133 of an ampere or .066 of an ampere in each instrument. Now suppose that in talking into the transmitter at

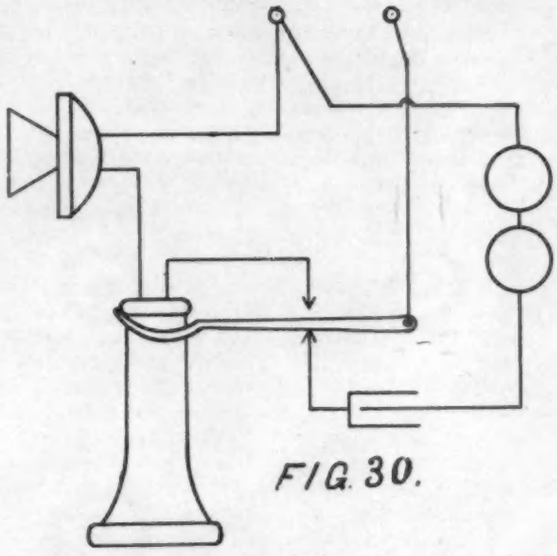


FIG. 30.

A the resistance of this instrument should be increased to 150 ohms; then the total resistance of the circuit would be 166 ohms. Circuit 4 would have 200 ohms, with the subscribers set, and the circuit M would have 100 ohms, with its telephone set. The total current flowing would be .12 of an ampere, one-third, or .04 ampere, of which would flow through instrument A and two-thirds, or .08 of an ampere, would flow through C. Thus we see that the current through instrument C has increased from .066 of an

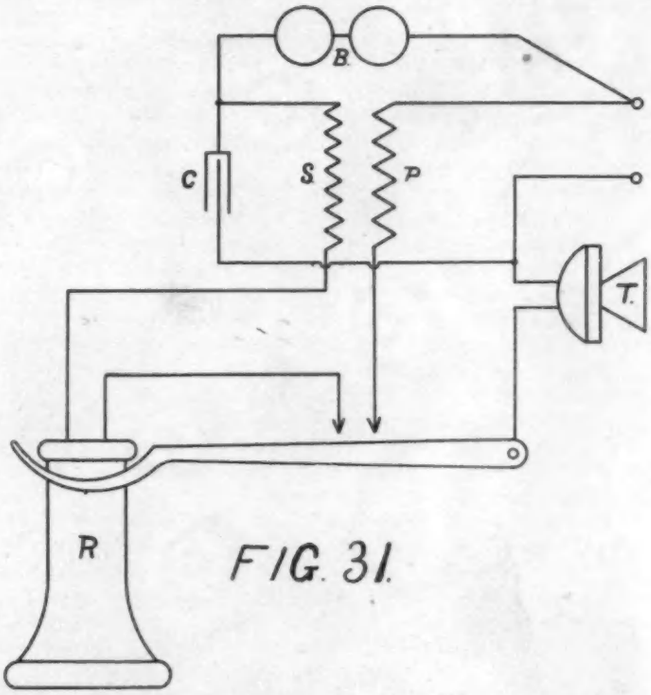


FIG. 31.

ampere to .08 of an ampere, a change of .014 of an ampere.

There is another theory in regard to this circuit which seems very plausible, and that is as follows: When the current is lowered suddenly in the circuit by any means, as, for instance, by the increasing of the resistance of the transmitter, the magnetism of the cores of the impedance coils is suddenly reduced. This sudden change in the magnetic

field causes a secondary current to be induced in the winding. This induced current is sent out over the line. Then when the current increases again there is another induced current from the change in the magnetism of the core. It is probable that both of these explanations are correct or that both effects occur.

In this type of common battery system, owing to the fact that the impedance coils may have an exceeding high impedance, the dangers from cross-talk is a great deal less than

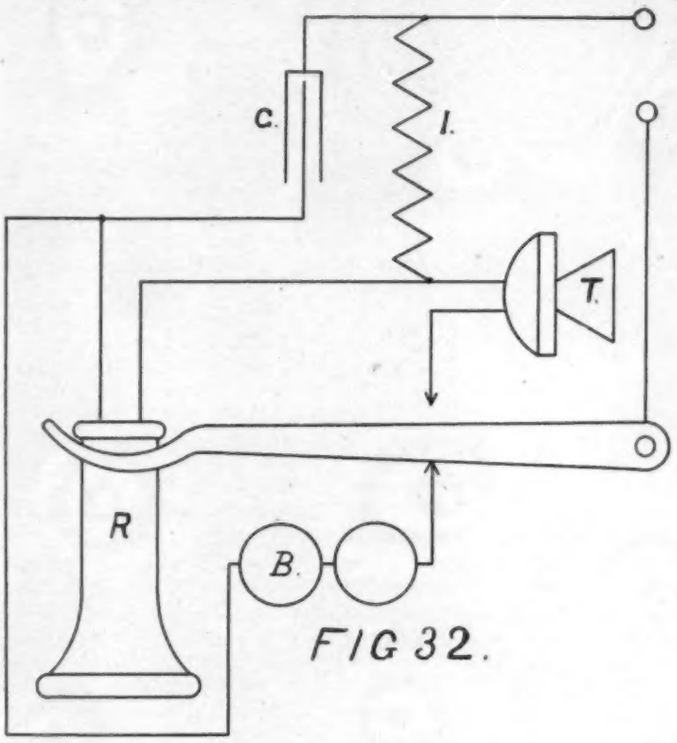


FIG 32.

in the type in which the repeating coil is used. The battery does not necessarily have to be of as low internal resistance and the amount of copper used for connections may be considerably less. There have been exchanges built in this country of as high as three thousand subscribers, with the main battery lead no larger than a No. 0000 copper wire, and there is no trouble due to cross-talk. Most of the small exchanges installed where primary batteries are used, employ a modification of this system. There are a large number of these modifications, all of which have their action explained wholly or mostly by the above description.

The subscribers' circuit in the above figures are of the simple series type, with the receiver in series with the transmitter. When this type is used (see Fig. 30) the reciever should have as low a resistance as possible so as not to add to the resistance of the line. Twenty to twenty-five ohms has been found to be about the lowest efficiently working receiver for this work. The bells, it will be seen, are in series, with a condenser, and are usually wound to a resistance of from 500 to 1,000 ohms. The condenser is one and a half microfarads or more. The one main drawback to this system is that the battery current flows through the receiver. This is all right if the current passes in the direction to increase the magnetism, but that is where the difficulty comes in. The current may be reversed on the line some time and then the receiver becomes demagnetized. Another fault is that it lacks the proper quality which many other combinations possess.

In Fig. 31 is shown the usual subscribers' circuit used by the Bell Company. It will be noticed that with the receiver on the hook the bells B and the condenser C are across the line. B has a resistance of 1,000 ohms and the condenser has a capacity of two microfarads. When the receiver is removed from the hook the condenser is in series with the secondary S of the induction coil and the receiver. The secondary circuit is connected in parallel with the transmitter T. The transmitter is in series with the primary P of the induction coil, and also in series with the line. The primary of the induction coil is wound with 1,400 turns, and the secondary with 1,700 turns of wire. Any incoming telephonic currents come into the subscriber's instrument and divide between the transmitter circuit and the secondary circuit. The part which goes through the transmitter passes through the induction, and there it is transformed on to the secondary circuit. An outward telephonic current passes through the condenser C, secondary S, receiver R, primary P, and out through the line circuit. The primary current also acts as a telephonic current, as it also is in the line. The effect of this circuit is to quicken the action, making a sharp, clear articulation. The side tone on this system is very strong. This is a very efficient form of circuit and gives results similar to local battery talking.

Fig. 32 shows an other subscriber's circuit recently devised, in which an impedance coil is used in place of the induction coil. With the receiver on the hook, the ringing is done in a manner similar to that shown in Fig. 31. When the receiver R is removed from the hook the battery current passes through the impedance coil and the transmitter T. Any current passing through of a telephonic nature is impeded by the coil and tends to pass around through the condenser C and receiver R, and the transmitter. This is a very

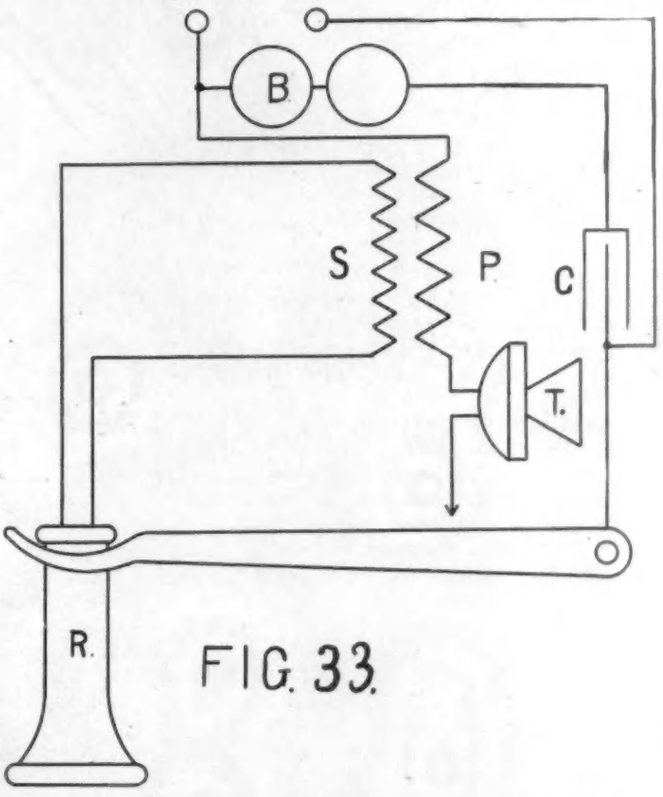


FIG. 33.

simple and very efficient circuit and is somewhat superior to the circuit shown in Fig. 31, as it has not such a strong side tone. The use of the condenser in the talking circuit seems to improve the quality, making the talk clear and sharp, cutting out the preponderance of the lower tones and accentuating the higher vibrations. It probably tends to sharpen the otherwise flattened peaks of the voice currents.

Another simple circuit is shown in Fig. 33. Here the transmitter T and primary P of the induction coil are in series and the receiver R is in series with the secondary S, on a local circuit. The bells B are, as usual, in series with a condenser C. This circuit does not give as good a quality as if the condenser were in the talking circuit, though it talks well.

Telephony.

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Table of Contents.

Fifth Annual Independent Telephone Convention..... 1-31
Well-Known Heads of Well-Known Houses..... 32
Illustrated Course in Telephony, VI-W. A. Taylor..... 33-35
EDITORIAL.
Volume Two..... 36
The Telephone Convention..... 36
The Re-election of Judge Thomas..... 36
The Next Convention..... 36
Death of Captain James D. Randall..... 37
The Nature of Sound..... 37
Indiana State Convention..... 37
The Local Telephone..... 37
The Independent Telephone Exchange at Scranton Pa..... 38-41
Youngest Telephone Conversationalist..... 41
A Prominent Telephone Man—J. J. Nate..... 41
Digest of Telephone and Kindred Patents, Edward E. Clement..... 42-45
Wisconsin State Convention..... 46-47
Vought-Berger Company..... 47
La Crosse (Wis.) Telephone Exchange..... 48
Common Battery Transmitters..... 49
Sumter Telephone Manufacturing Co..... 50
Monarch Telephone Manufacturing Co..... 51
Apparatus for Testing Telephone Cables..... 51
A New Pay Station Telephone..... 52
New Telephone Line Appliance..... 52
Trade Notes..... 53-54
Acme Electric Company..... 54-55
A View of Corporations, VII- Grant Newell..... 55-56
Decisions Affecting Telephony..... 56-57
Strowger Automatic Exchange..... 58-59
Tolls and Toll Lines—R. S. Abbott..... 60-63
Independents and Monoply—Charles H. Schweizer..... 63-64

VOLUME TWO.

With this number TELEPHONY enters upon its second volume with a subscription price of one dollar a year. We believe our readers will agree with us that the publication is worth a dollar, and, with the improvements mapped out for the future, TELEPHONY will continue to be the strongest and best telephone journal published in the world.

Within the first six months of our existence we have received over five thousand subscriptions. We hope to do as well during the remainder of this year and close our second volume with ten thousand subscribers on our books. To do this we need the coöperation of everyone interested in telephone work. We would like to ask each of our subscribers to secure us one additional subscription. This could easily be done in most cases, and would be an easy solution to the problem and give us the desired ten thousand subscribers. This kindness would be appreciated.

We have in preparation two new features for TELEPHONY, which we believe will be of widespread interest. The first one, "The Story of the States," will begin in August, the other, "A Digest of the Telephone Literature of the World," will begin in September. These, with our regular features, as well as the new articles by well-known writers, which have been arranged for, will make volume two a great deal better than its predecessor. In "The Story of the States" we will take a particular state and tell its telephone history. Maps of both Independent and Bell lines will be given, as well as the names of everyone interested in telephone work in that particular state. The names and number of exchanges and toll lines will be printed, together with the number of instruments in use, miles of wire, etc. Several of the prominent exchanges will be illustrated, with portraits of the leading telephonists in the state. The feature will aim to cover the telephone history of the state complete and in detail. We will begin this series with ———— but that would be telling, so we will wait until August and see which state has been selected, and why.

The scope of our other new feature will be given in our August number.

THE TELEPHONE CONVENTION.

The fifth annual convention of the Independent Telephone Association of the United States of America, recently held in Buffalo, N. Y., was in many respects a most remarkable gathering. To those of us who have watched the growth of the Independent movement and attended the four preceeding national conventions, this last one seems to have struck a broader and a higher keynote, and the proceedings throughout were marked with dignity, harmony and a prevailing feeling of good fellowship which promises well for the future of the association. The attendance was large and representative, the papers were unusually good and the interest was sustained throughout the three days, notwithstanding the many and varied attractions offered visitors in the Bison City. The entire proceedings of the meeting are given in this issue of TELEPHONY, together with all the papers read, and a complete list of the attendants. Especial attention is called to these papers, some of which are noteworthy contributions to telephone literature, and deserve careful reading.

THE RE-ELECTION OF JUDGE THOMAS.

One of the marked features of the late national telephone convention was the rising vote of thanks tendered President Thomas for his able administration. It was a sincere tribute to him as an officer and a man, while his unanimous re-election for the fifth consecutive time to the highest office in the gift of the association showed that the members were keenly appreciative of his loyalty and devotion to the cause of Independent telephony. Judge Thomas is unquestionably the strongest and most popular man in the Independent field, and his re-election is a matter for sincere congratulation.

THE NEXT CONVENTION.

The next annual convention of the Independent Telephone Association of the United States of America should be held in a western city, preferably Chicago. The reasons for this are obvious and many. While there are a great number of Independent exchanges being built in the East, and a considerable amount of eastern money is invested in Independent exchanges generally, the fact still remains that the stronghold of the movement is in the central West. The South or the North has an equal claim with the East for the next annual meeting, but stronger than all three combined is the claim of the metropolis of the West—Chicago.

This city is pre-eminently a convention city and is the home of the Independent movement. Three-quarters of the telephones in use in the world have been manufactured here, and within a radius of five hundred miles of Chicago will be found in use at least half of the telephones manufactured. This is a strong statement, but it is true nevertheless. With this in mind, it seems only reasonable that Chicago should be selected for the next annual convention.

DEATH OF CAPTAIN JAMES D. RANDALL.

This publication regrets to announce the death of Captain James D. Randall, which occurred at his home in Memphis, Tenn., on Friday, June 21, after a short illness.

Captain Randall was for seventeen years a steamboat captain on the Mississippi River. For a number of years he has given his time exclusively to electrical engineering, especially in the telephone line. He was instrumental in building several telephone exchanges and was one of the telephone pioneers. About three years since he took an active part in organizing the Southern Independent Telephone Association, of which he was elected president, which position he held until his death. Mr. C. W. Bolton, secretary of the Southern Independent Telephone Association, in speaking of his late friend and co-worker, says:

"Captain Randall was a man in the true meaning of the word and a true friend; a good citizen, a good husband and a Christian. The electrical world, especially telephony, has lost a valued friend and co-laborer. It will be hard to fill his place. He has done more to build up the Southern Independent Telephone Association than any other member. A good man has crossed the river and we will sadly miss him."

THE NATURE OF SOUND.

The nature of sound is explained in very simple language in the following, which is the inscription on Everett's model, 1863:

"Silence in action is sound in motion. Sound and silence, then, belong to the order of dual substance in unity. This 'phonic unity I have discovered and demonstrated to be an independent imponderable phonic cystoplastic suisysmoris, which cannot be divided or destroyed. It resides in all non-metallic atoms, which not only part with it, but transmit, reverberate and absorb it."

INDIANA STATE CONVENTION.

The annual meeting of the Indiana Independent Telephone Association will be held in the city of Lafayette, Ind., July 29 and 30. This will be the largest meeting held by any state association and will be of great interest and benefit to those attending.

There will be papers and discussions upon subjects of vital interest to telephone people, displays will be made by the leading manufacturers and there will be reduced rates at the hotel, headquarters being at the Lahr House. There will be a program of entertainment, such as trolley rides, vaudeville shows at the Park, steamboat rides, music and a banquet, all of which will be free to telephone men.

The Sterling Electric Company is sending out invitations to this meeting, in which it says:

"As this is the home of our factory, we wish to extend an invitation to you in addition to that extended by the association. It matters not whether you are a member of the association or not. We want every man here that is interested in the Independent telephone movement in Indiana. There will be no assessments nor charges, but a harmonious meeting for the advancement of Independent telephone interests."

"We earnestly and urgently request that every company in Indiana be represented and can assure them that we will endeavor to make their stay in our city profitable and pleasant. Notify your neighboring companies for fear we might overlook them. We want all Indiana telephone men to attend. Come and help make the Independent telephone movement in this state the strongest and most united of any state in the Union."

WHAT SHALL THE WORD BE?

The question, "What shall we call a message sent by telephone?" is agitating the western public, and it is an interesting one, says the American Telephone Journal. A message sent by telegraph is termed a telegram, and very properly so, but we can't very well call a telephone message a "telephrone" or anything like it. What, then, shall we do? A writer in the Bloomington (Ill.) Pantagraph, a very bright paper, by the way, condemns the use of "telepheme" and would say "telephem" instead. In our opinion that is a distinction without a difference. What is required is a term that possesses sense as well as euphony.

THE LOCAL TELEPHONE.

Have you registered your troubles?
  Have you picked your little bone
With that awful corporation
  Called the "local telephone?"
Have you told about the bother
  Every time that you would seize
That infernal old receiver
  And would ask for "Main 2, please?"

Have you told them how you waited
  With the thing glued to your ear?
How you shouted, whooped and helloed,
  But no answer you could hear?
Then at last a sweet-voiced angel
  Answered back in words like these:
"Line is busy just at present,
  Wait about five minutes, please."

You remember how you waited—
  You were on a party line,
And the awful words you uttered
  Dictionaries can't define.
Then again you called up "Central,"
  In a very savage tone,
And you asked her "What in thunder
  Ailed that blank-dashed telephone?"

"Nickel, please," she sweetly murmured,
  "Drop your nickel in, I say."
And, of course, you dropped the nickel,
  Jammed it in the box to stay.
But the very act was madd'ning,
  And you used some swear words, when
She replied: "It's out of order,
  Guess you'll have to call again."

Tell about the horrid noises
  That go scooting through the wire;
Of the roaring and the buzzing
  That would so arouse your ire;
How they give you every number
  In the book except your own—
One of the eccentric features
  Of the "local telephone."

Have you registered your kick yet?
  Do it, for you've one to make;
Do it for a suff'ring public,
  If for no one else's sake.
While the chance is open, grab it.
  You will not be all alone,
There are others who have tasted
  Of the "local telephone."

—E. A. Brininstool in American Telephone Journal.

THE INDEPENDENT TELEPHONE EXCHANGE AT SCRANTON, PA.

About the first of January the exchange of the Lackawanna Telephone Company of Scranton, Pa., began to operate. The exchange was built under the able management of Mr. S. E. Wayland, who had previously built the exchange of the People's Telephone Company of Wilkesbarre, Pa.

It was the original plan to install central office apparatus for 2,400 subscribers, but before it was installed it was found that this number was inadequate and an order was placed for additional switchboard apparatus, increasing the actual equipment of the original plant to 3,000 lines, the ultimate capacity being 6,000 lines.

A striking feature in connection with this exchange is the fact that it is operated on what is called the "two-wire" multiple system. The circuits of the board have been simplified so that none of the answering jacks or multiple jacks require more than a single pair of wires running to them. One of the greatest difficulties in the manufacture of very large multiple switchboards is that of reducing the answering and multiple jacks to a size sufficiently small to permit of as large a number of them as is desired being placed within reach of a single operator. The simplicity of the construction of this two-contact type of spring jack is such that it is without any difficulty reduced to three-eighths inches between centers, and, in case it should be desirable, may readily be reduced to one-quarter inch between centers. And not only are these very important advantages secured by this arrangement, but further advantages in reduction in the number of spring jack trouble cases is obtained by the use of the "two-wire" system, as all removable spring jack contacts are avoided.

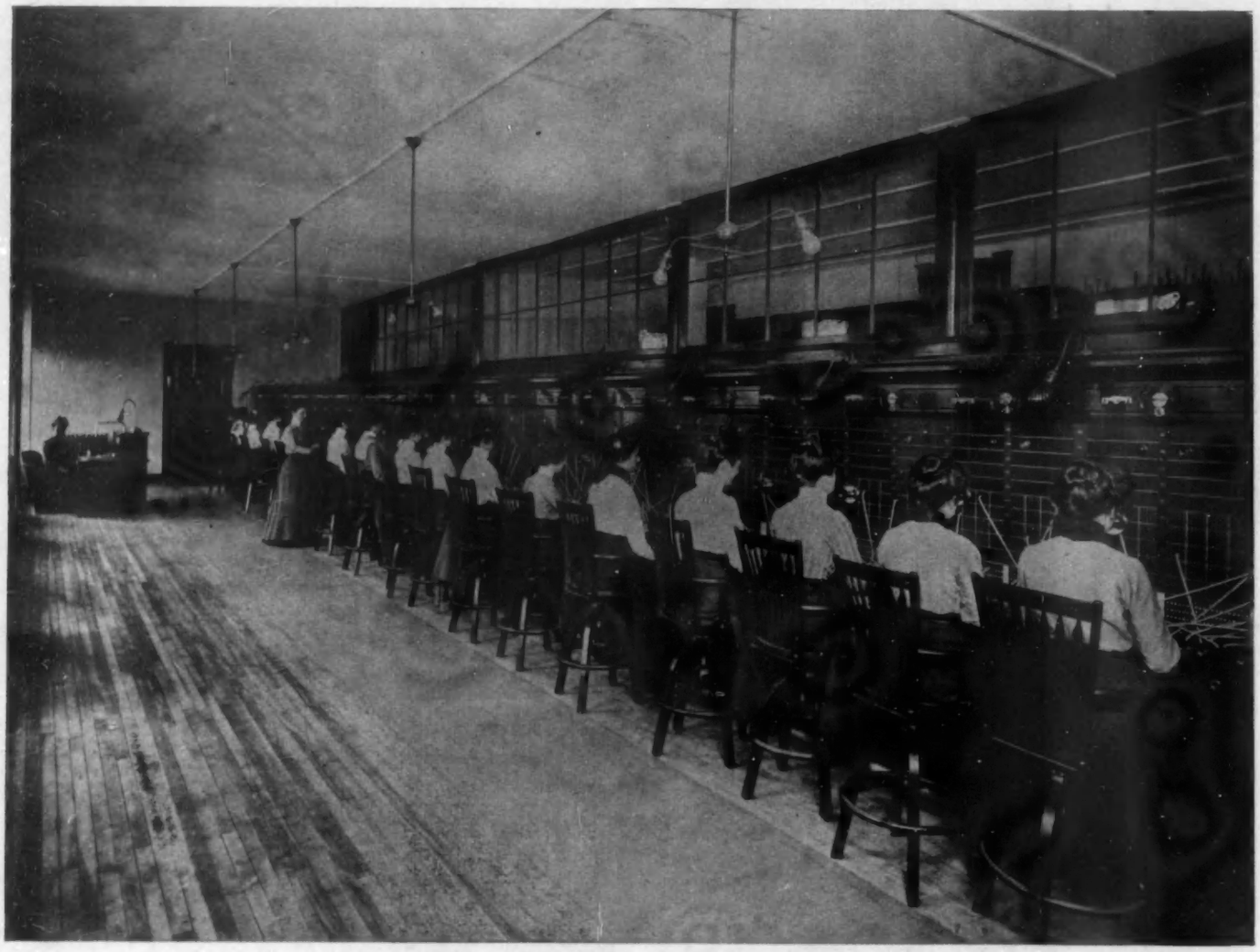

FIG. 1—INDEPENDENT TELEPHONE EXCHANGE, SCRANTON, PA.

The switchboard is of the straight multiple type with lamp line and supervisory signals, current for both the talking and signaling being supplied by the central battery. The present switchboard equipment consists of ten sections of three operator's positions each.

The entire central office equipment and the subscribers' instruments were manufactured by the Kellogg Switchboard and Supply Company of Chicago.

The multiple switchboard section consists of an angle iron framework which, without the aid of the inclosing woodwork, serves to support all apparatus in a rigid manner. The woodwork is of the best grade of mahogany, having a dead finish and presenting a handsome appearance. The key-shelves are of five-ply mahogany, the alternate layers having the grain running in different directions in order to prevent warping.

The cable heads are of the Cook pattern and are provided with heat coils and carbon arresters of the well-known Cook type. From the cable heads, which are mounted on iron racks located in the terminal room on the first floor of the building, cables are led through cable shafts to the line side of the main distributing frame. From the switchboard side of the main distributing frame cables are led to the relay frame upon which are mounted both line and cut-off relays. Thence cables lead back to the line side of the intermediate distributing frame, and from the switchboard side of this frame other cables lead to the answering

jacks and lamps in the various sections of the switchboard, and others to the multiple cables running the entire length of the switchboard.

The main distributing frame is, of course, for the purpose of readily permitting a change in the relation of any line from the outside to any line leading to the switchboard. The intermediate distributing frame is for the purpose of permitting a change in the relation between any answering jack and a group of multiple jacks.

A general front view of the exchange is shown in Fig. 1, a rear view in Fig. 2. This later illustration gives as good an idea of the systematic and careful arrangement of the cables and wires and apparatus, which is essential to a well constructed switchboard as can be had without seeing an exchange in actual operation. The problem is one which involves the placing of a very great number of various parts in a small amount of space and at the same time placing everything in such a position that it is readily accessible at all times.

In Fig. 3 is shown a close view of one section of the Scranton board with one panel removed, showing the cords, and with one key shelf raised showing the combined ringing and listening keys and the cabling for them.

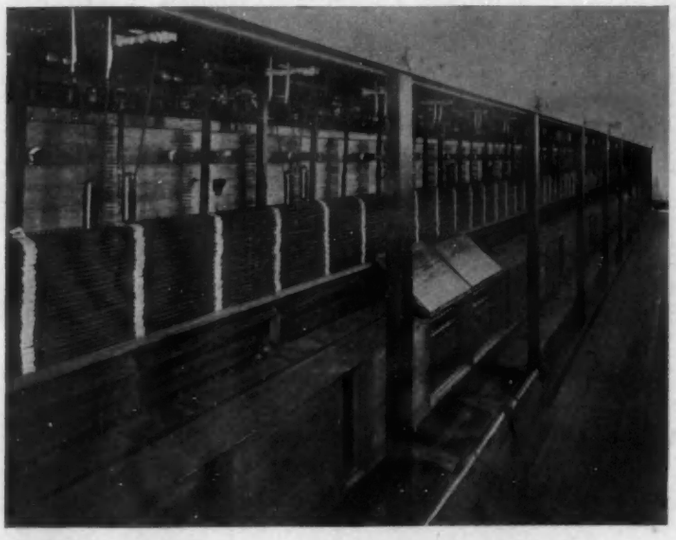

FIG. 2—INDEPENDENT TELEPHONE EXCHANGE, SCRANTON, PA.

Fig. 4 is an illustration of a lamp signal switchboard recently installed by the manufacturers of the Scranton board, and which is here given as showing to the best advantage the arrangement of parts in a modern lamp signal multiple switchboard. In the front of the shelf are shown the combined ringing and listening keys, which are arranged to ring upon the calling cord only. This is the usual practice in large multiple switchboards, ringing back, when necessary, being done by inserting a calling plug into the answering jack. Between the ringing and listening keys and the plugs are seen the supervisory lamps, of which there are two to each pair of plugs. These are protected from accidental breakage by the usual jeweled cap, and in addition by an open-work metal protector. The line lamps and answering jacks are shown in the lower part of the switchboard surface. The strips of each alternate so that each answering jack is above the line lamp to which it corresponds, thus avoiding the necessity of the operator consciously locating the answering jack corresponding to a line signal. As shown, both the line lamps and answering jacks are mounted twenty per strip. The multiple jacks are shown above the line signal apparatus divided into blocks of twenty-five by means of white lines. In addition to the line signals and supervisory signals each operator's position is equipped with a calling and a supervisory pilot lamp, the former being lighted as long as any subscriber is seeking connection and a line lamp lit; the latter being illumined when subscribers have signaled for disconnection. These lamps are merely safeguards against neglect on the part of the operator to notice one of the small line or supervisory lamps and also being in plain view of the chief operator, they serve as telltales as to whether the operators are properly attending to their work. In addition to these pilot lamps there is also provided a calling and a supervisory pilot lamp common to the entire exchange.

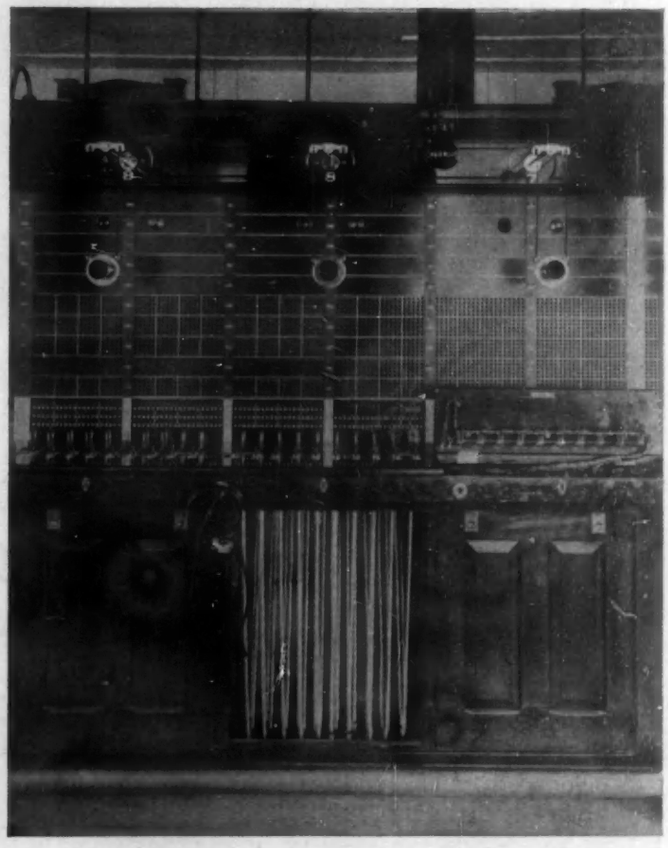

FIG. 3—INDEPENDENT TELEPHONE EXCHANGE, SCRANTON, PA.

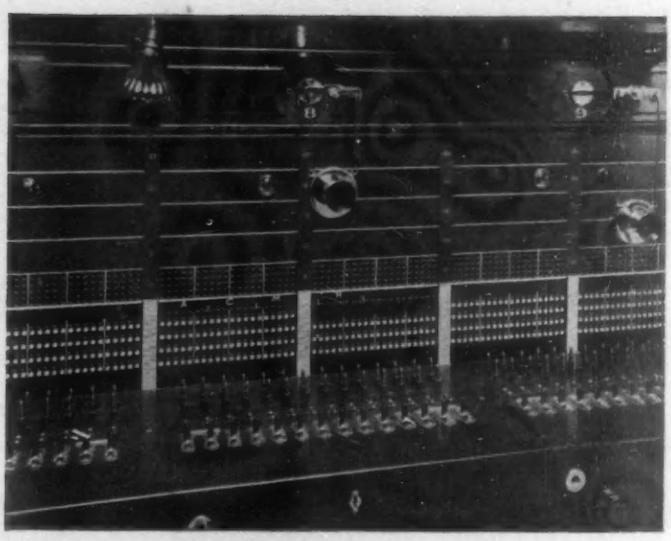

FIG. 4—INDEPENDENT TELEPHONE EXCHANGE, SCRANTON, PA.

The following is a description of the method of operation of the Scranton board: All calls are made by the local subscribers by the removal of their telephone from the

switch-hook, which operates to close the local circuit of the line lamp belonging to his line by energizing the line relay appropriate thereto. The line lamp is cut out of circuit by the insertion of the answering plug into the answering jack of the subscriber calling for the connection which energizes the cut-off relay of that particular line.

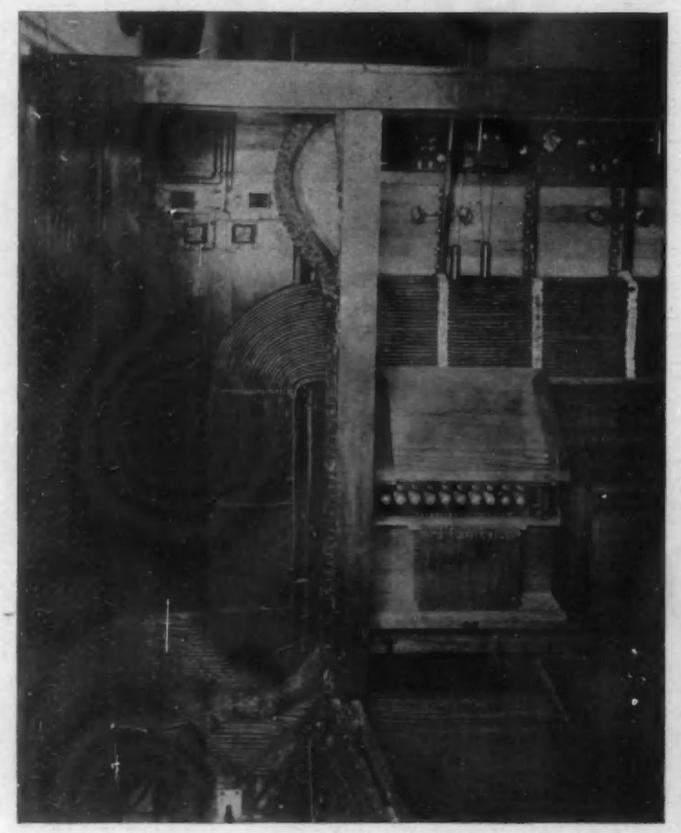

FIG. 5—INDEPENDENT TELEPHONE EXCHANGE, SCRANTON, PA.

Each cord circuit is provided with two supervisory lamps, one lamp being associated with the answering plug and the other with the calling plug. The lamp associated with the answering cord is controlled by the movement of the telephone hook at the subscribers' station with which

FIG. 6—INDEPENDENT TELEPHONE EXCHANGE, SCRANTON, PA.

this cord is connected, and the lamp associated with calling cord is controlled by the movement of the telephone hook at the subscribers' station with which this cord is connected. Thus by the condition of these two supervisory lamps the operator has visible and positive indication of whether or not either connected subscriber has his telephone off or on its hook. When both lamps are lighted the operator knows that the two subscribers have finished their conversation and both have hung up their telephones upon their respective hooks. Until the called for subscriber has responded to the call the supervisory lamp associated with the calling plug will remain lighted, thus indicating that the called for subscriber has not responded and that another ring should be given him. Thus the operator knows without the necessity of listening-in whether the called for party has answered the call; she knows whether disconnection is desired; she can know if one connected subscriber desires another connection after he has finished the conversation with the party to whom he is connected, as in this case he can signal the operator by moving his telephone hook up and down, thus alternately lighting and extinguishing the supervisory lamp then associated with his line. In fact, every subscriber in the exchange is able under every possible line condition, at any time he so desires, to signal the central office, inasmuch as he has under his control, whether connected with another subscriber or not, a lamp signal either line or supervisory at the central office.

In Fig. 5 is shown the cable turning section, in which it is seen that the entire body of multiple cables are bent

FIG. 7—INDEPENDENT TELEPHONE EXCHANGE, SCRANTON, PA.

down to the floor, after which they pass through a horizontal running box to the proper terminals on the switchboard side of the intermediate distributing frame.

In Fig. 6 is shown a view of the relay frame and in the background the distributing boards. The relay frame is of iron and the line and cut-off relays are mounted upon it in strips of twenty. A relay strip is of heavy wrought iron and upon it the relays are mounted in pairs, a small relay alternating in the strip with a large one. The small relay is in each case a line relay, the coil of which is placed directly in the line circuit, so that the closing of the line by the removal of the subscriber's telephone from the switch-hook causes it to energize and close the local circuit of the line lamp. The large relay is in each case the cut-off relay which is energized by the act of the operator in plugging into the line whereby it cuts off the line signal and at the same time completes the talking circuit.

In Fig. 7 is shown a general view of the power room. To the right in the foreground is shown the fuseboard to which the discharge leads from the battery lead directly. From this board wires are led to the individual cord circuits at each section. The fuseboard is of marble upon an iron frame.

Adjacent to the fuseboard is shown the power switchboard. This consists of a marble slab mounted upon an

iron framework and equipped with Weston measuring instruments, two circuit breakers with under and over load attachments, together with the usual full equipment of shunts, knife switches and fuses for accomplishing the circuit changes as required. On the left of the same figure are shown the charging and ringing machines. These are mounted on a power table of angle iron, inclosed in paneled woodwork.

In Fig. 8 is shown the tollboard of the exchange. The company has adopted a liberal policy in this matter and

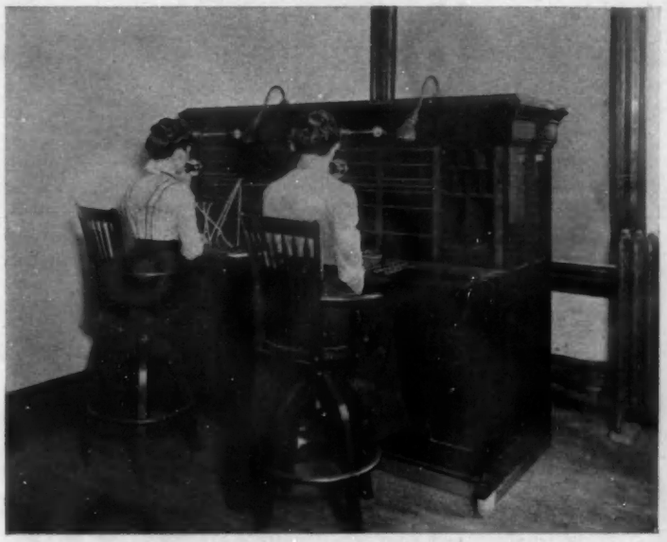

FIG. 8—INDEPENDENT TELEPHONE EXCHANGE, SCRANTON, PA.

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Everything in connection with the exchange is of the best, and, as a whole, it represents the most advanced state of telephonic development. It is the first lamp signal board of large size installed by an Independent telephone company, which is itself a fact of which the company may justly be proud.

YOUNGEST TELEPHONE CONVERSATIONALIST.

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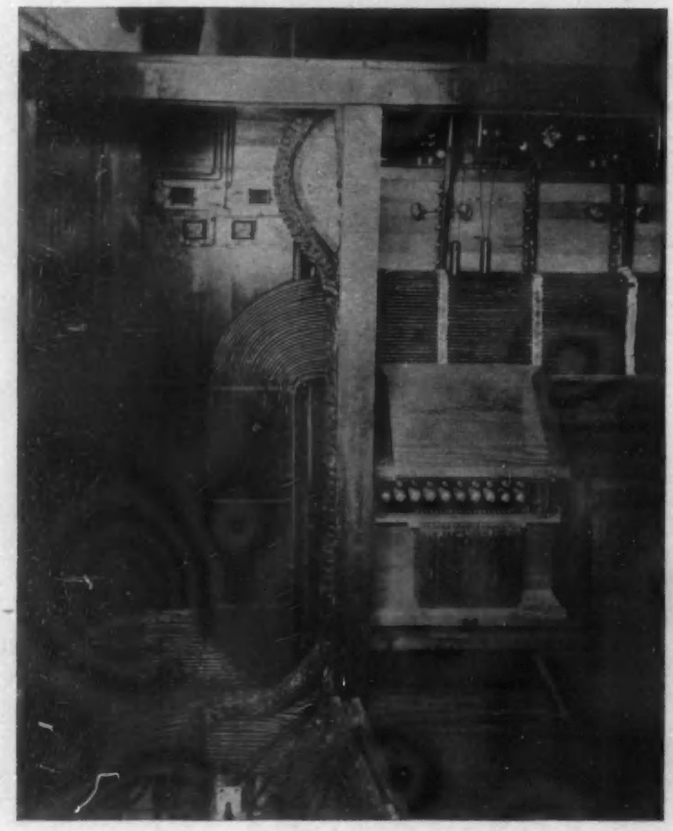

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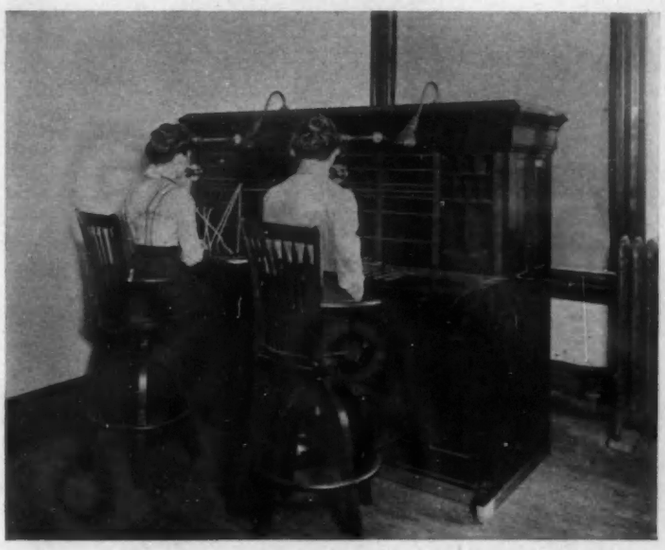

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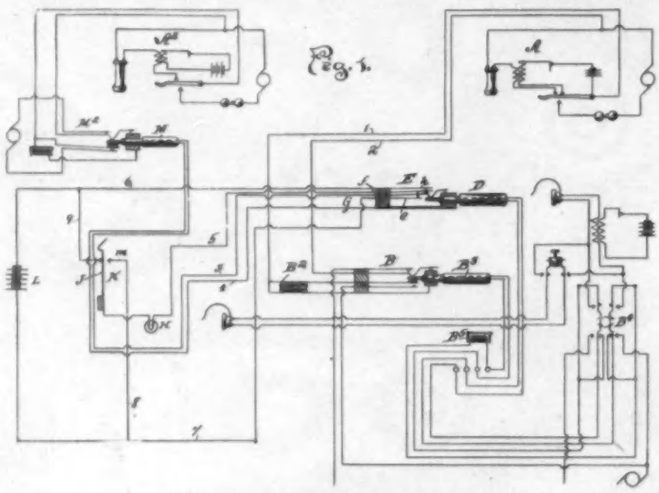
DIGEST OF TELEPHONE AND KINDRED PATENTS.

CONDUCTED BY EDWARD E. CLEMENT.

May 21.

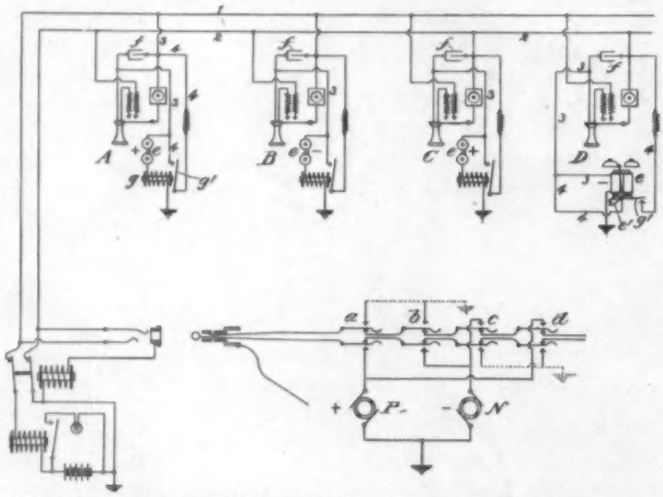
674,402.—H. A. Douglas. Telephone Switchboard.

The invention in this case is really a trunk signal circuit for transfer systems. A is a calling subscriber and A^3 is the wanted subscriber, with lines connected to jacks B and M^3 respectively, on different sections of a switchboard, The operator at the calling subscriber's section answers by inserting plug B^3, clearing out signal B^5 being in the cord connecting this plug with its mate D. Finding A^3 is wanted, the operator inserts plug D in trunk jack E, which automatically signals the operator at the other section by light-



674,402—TELEPHONE SWITCHBOARD.

ing lamp H, this also indicating the trunk used. The circuit is from a common battery L to its bus wire 7, by wire 8 to plug seat switch K of the trunk plug, to lamp H, by wire 5 back to the calling section and to spring f in the trunk jack E, thence to spring h, against which f is forced by plug D, by wire 6 back to the battery. On lifting the trunk plug M from its seat K the lamp is extinguished, as the lamp is cut over to wire 9 by spring J, but if the plug is removed from the subscriber's jack and replaced in its seat while the plug D is still up, the lamp will relight as a warning signal. With the connection set up, if the subscribers ring off, signal B^5 shows, and the answering operator withdraws plug D from jack E. Lamp H then



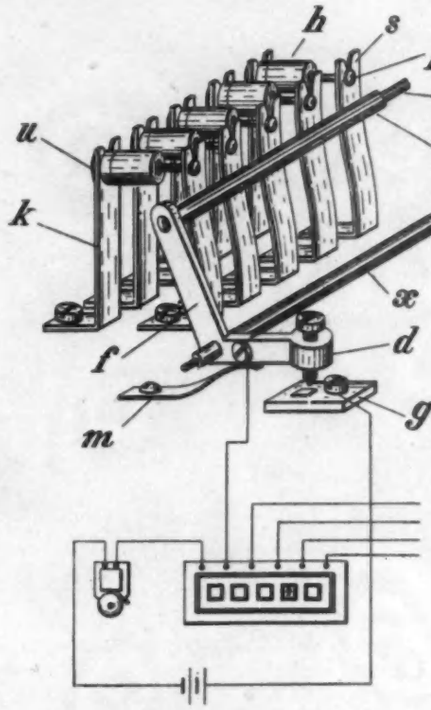
674,515—CALLING APPARATUS FOR PARTY TELEPHONE LINES.

lights as a disconnect signal, the circuit being by wire 7 to spring e of jack E, spring f and wire 5, and back to battery. When plug M is replaced in 5 seat the lamp again goes out. A separate instruction circuit is employed.

674,515—J. J. O'Connell. Calling Apparatus for Party Telephone Lines.

This is an ingenious means for permitting the ringers on selective party lines to be worked with intermittent current as satisfactorily as with alternating. Heretofore this has not been possible on account of the condensers included in the ringing circuits. The condensers are necessary to cut off direct current from the main battery, which would find a path through the grounds on the line, and thus disturb the signalling system. The scheme is very simple. It consists merely of a shunt closed about the condenser when current passes through the ringer. Thus at station A in the figure, where plug current on wire 1 is required to actuate the ringer e, a quick acting relay g is provided in series with the ringer in the ground tap. This relay controls a shunt 4 about condenser f. When an impulse comes over the line one stroke is sounded on the ringer, and the relay immediately closes the shunt about the condenser, providing a local circuit for its discharge, so that it is "cleared out" ready for another charge by the next impulse.

At station D the ringer itself, e, controls the shunt by contact g'.



674,541—PROTECTOR FOR TELEPHONE OR TELPGRAPH INSTRUMENTS.

674,541—J. Piel. Protector for Telephone or Telegraph Instruments.

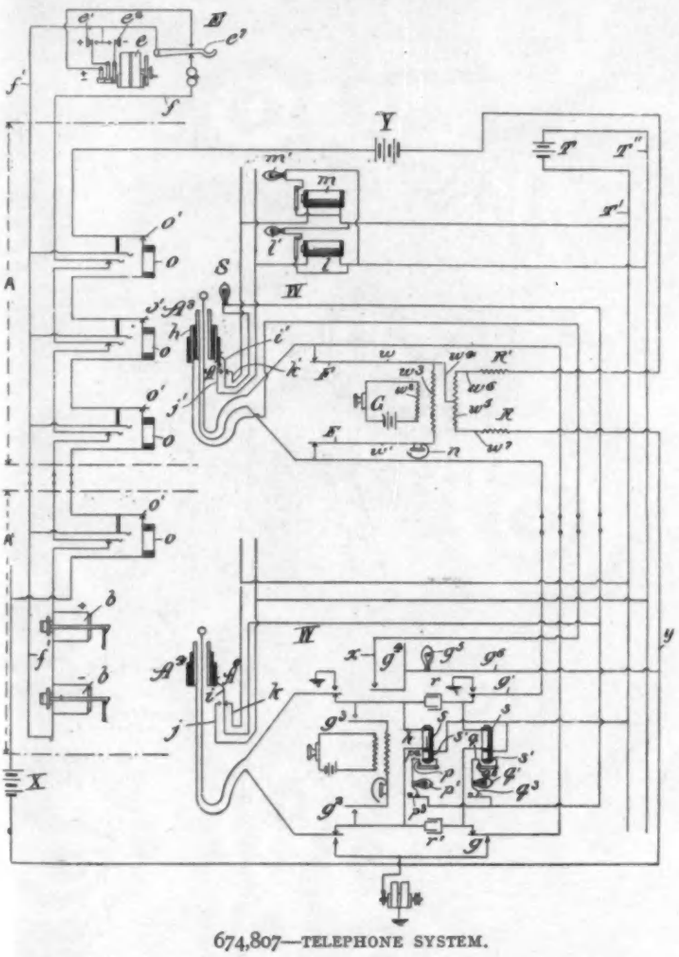
This is a scheme whereby the burning out of any one of a group of "sneak current arresters" will display a signal indicating the group and render its location easy.

A well-known arrangement of sneak current arresters, shown in the figure, is employed. Along the springs on each side of a group of fifty a bar y is provided, mounted in the upper ends of pivoted bell crank levers f, one of whose lower arms carries a contact d, normally held up above a twin contact g, by spring m. When any line spring s is released, it flies out, forces back bar y, and closes circuit at g to an annunciator or bell.

674,807—E. E. Yaxley and C. C. Cadden. Telephone System.

This is a multiple board system wherein the object is to largely reduce the number of multiple jacks required. The principle resorted to is that of all the well-known "divided multiple" boards. Each line has one answering jack on an answering section, and as many multiple jacks

as may be found desirable, one multiple jack in each of several "classes" into which the lines are divided for finishing connections. All connections are initiated on the answering board and trunked to the group or class wanted, where the connection is completed. Each subscriber has a hand generator for calling and a set of push buttons and commutators arranged so that he can throw current of different direction on the line. At the central office he is provided with as many line signals as there are classes of lines, so that he is able to designate to the answering operator without speaking, which class the wanted subscriber is in. The operator then selects a trunk plug, as A^4, whose circuit goes to the desired class and initiates the connection therewith. The plug, when lifted from its seat, throws a switch A^6 which sends current to an individ-



674,807—TELEPHONE SYSTEM.

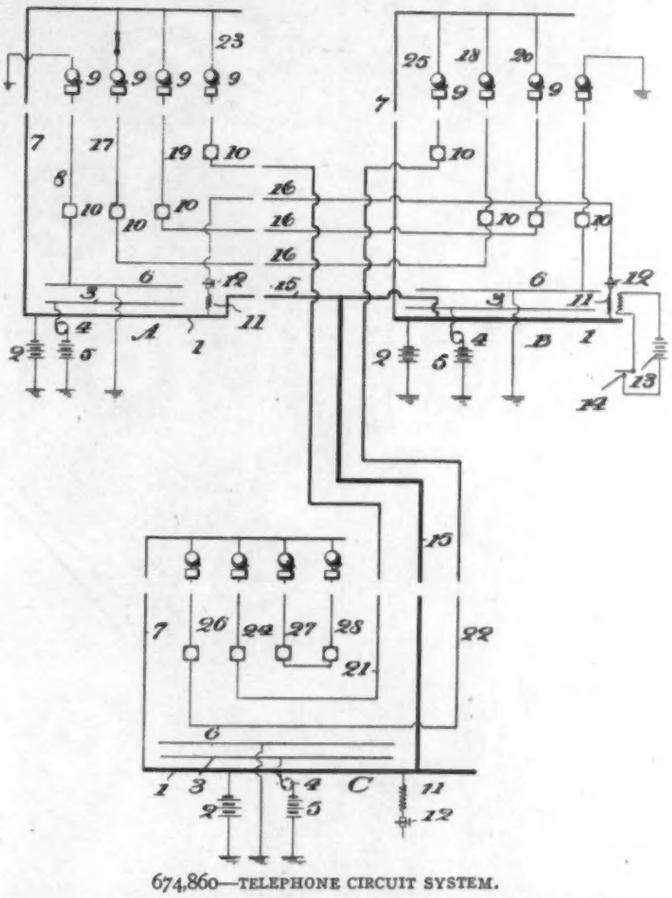
ual trunk signal S and a pilot signal l' at the multiple section. The operator there uses the listening key F and ascertains the number wanted. To test the line she applies the tip of plug A^3 to the jack ring in the usual way. X and Y are two test batteries connected through the jack rings and test springs o' in series, and in opposition. If a line is busy some one of the jack connections in the test circuit is broken, and current from one battery or the other will flow over the wire Y and through one or the other half of tertiary winding w^3 on operator's induction coil, giving an induced impulse and corresponding click in her receiver. If the line is not busy current will flow through both sides of the operator's tertiary winding differentially, and if the circuits are very nicely balanced no noise will be heard.

The trunk line is divided by condensers 2-2', so that when subscribers ring off with their generators the bridged annunciators h and q will respond separately. The inventors expect to secure this result by regulating the capacity of the condensers. Each annunciator has an extra winding s', closed when it is actuated, and in a local circuit, so the signal once set will remain set until released by the operator. Alternating current is used for ringing off.

May 28.

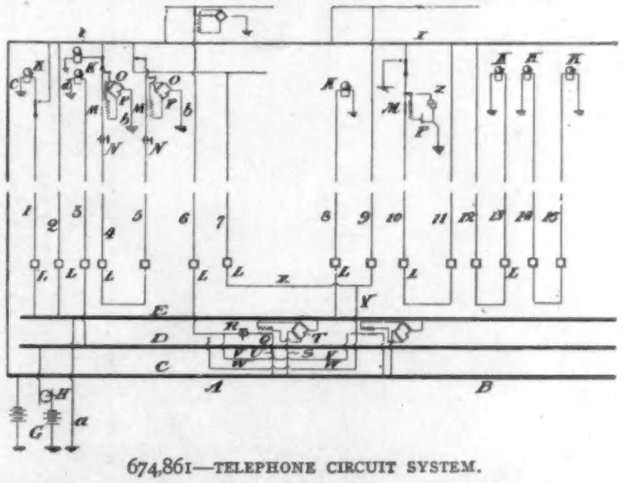
674,860—E. F. Frost. Telephone Circuit System.

It is difficult to discern any invention in this case. The scheme is very poorly set forth, but seems to be merely a



674,860—TELEPHONE CIRCUIT SYSTEM.

set of common returns, one for all the lines radiating from each of several central offices, together with a common return 15, connecting the several common returns.

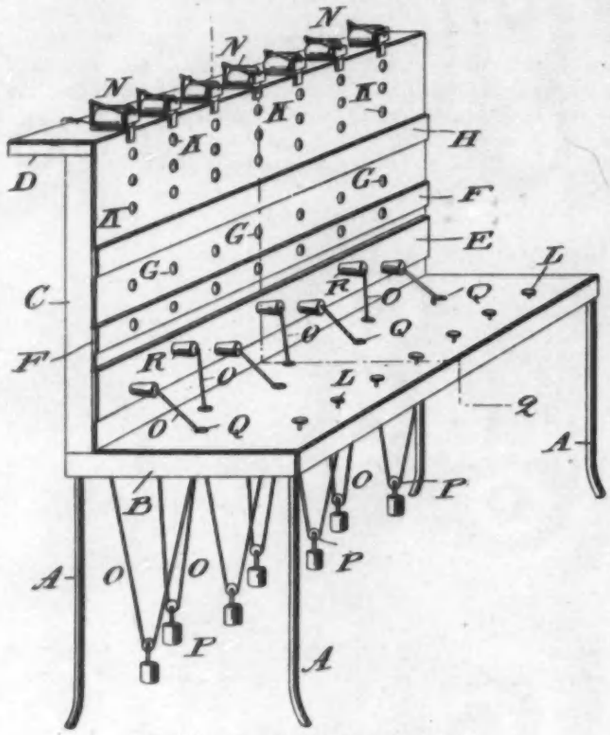


674,861—TELEPHONE CIRCUIT SYSTEM.

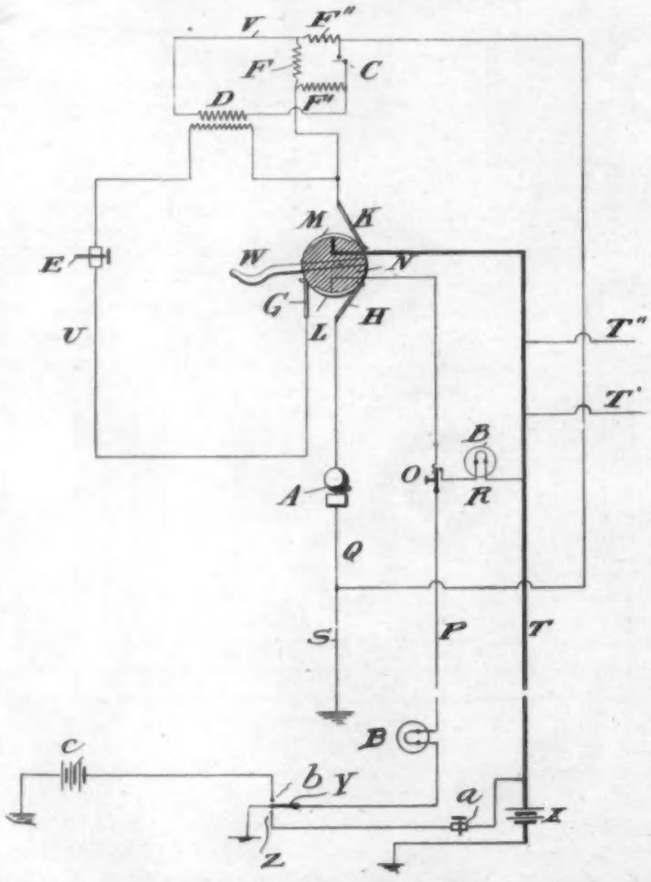
674,861—E. B. Frost. Telephone Circuit System.

The name of this system constitutes the principal invention. Mr. Frost takes a common wire to all of his subscribers' stations to furnish a current supply, and at each station hitches on a Wheatstone bridge with the microphone in one arm of the bridge and the primary in the bridge wire. The secondary is in the line with a receiver. The

idea would be novel and interesting if Mr. Edison had not patented it many years ago. Mr. Carty improved on it later. Twenty-four claims were granted by the patent



674,862—TELEPHONE SWITCHBOARD.

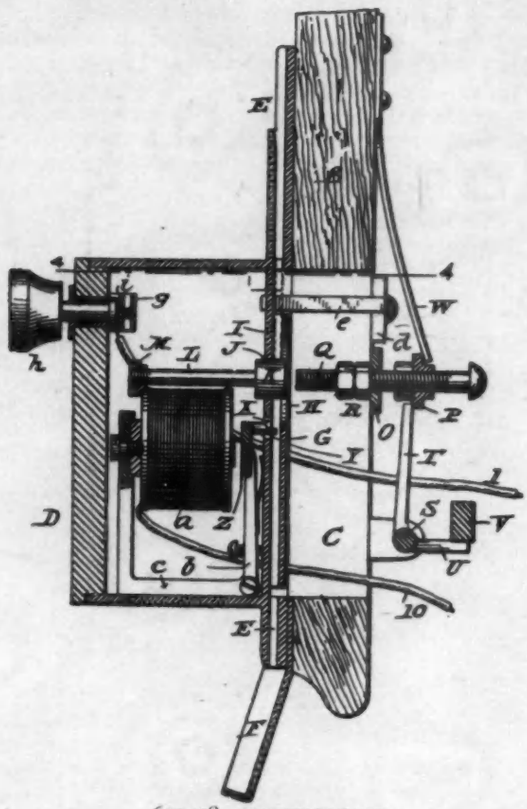


674,964—TELEPHONE CIRCUIT SYSTEM.

office on this alleged invention, with which Mr. Frost's knowledge of the art probably leads him to be perfectly satisfied.

674,862—E. F. Frost. Telephone Switchboard.

This invention is a practical joke. An old-fashioned common return system is shown, H, F and E being "bus" bars. A primitive form of switchboard is also shown similar to those first designed in 1878. It accommodates seven lines and has seven plugs, forty-two "sockets," seven annunciators and three "bus" bars. The plugs are line

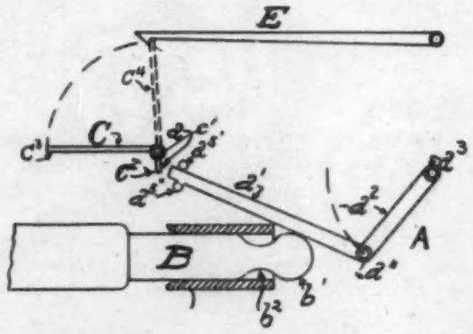


675,378—PAY TELEPHONE.

terminals and are all normally stuck into sockets in a battery bus, which permits calling in. When connection between lines is made the plug of one line is placed in a socket of the other and the odd plug is used to listen in.

674,964—E. F. Frost. Telephone Circuit System.

The present case has to do with the subscriber's apparatus to be used with the systems above, and the individual line apparatus at central. T is a common return or "tree



675,377—SIGNALING DEVICE FOR TELEPHONE SWITCHBOARDS.

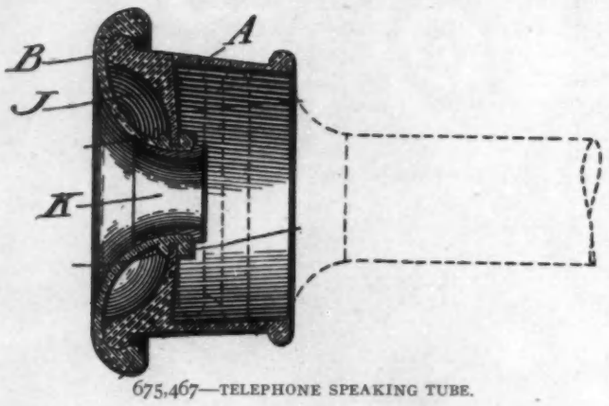
wire" branching to all subscribers' stations and at each adapted to be connected to a bridge F, F', F", C, with the microphone C in one arm, and the primary of the induction coil D in the bridge. P is an individual wire connected to the line signal B at central and switch segment I at the subscriber's station. A calling button O is also included in this wire. To call out, the operator switches battery c onto the wire P, while to call in the subscriber presses button O, thus connecting the wire P through lamp B to

common battery wire T, thus sending current from battery X through line lamp B at central. E is subscriber's receiver and A his ringer. T′ T″ are branches of the common return going to other stations.

June 4.

675,377—H. C. Dodge. Signalling Device for Telephone Switchboards.

This is a mechanically self-restoring drop and jack. The jack is below the drop and so arranged that the tip of a plug, on entering, strikes one member, a′, of a toggle

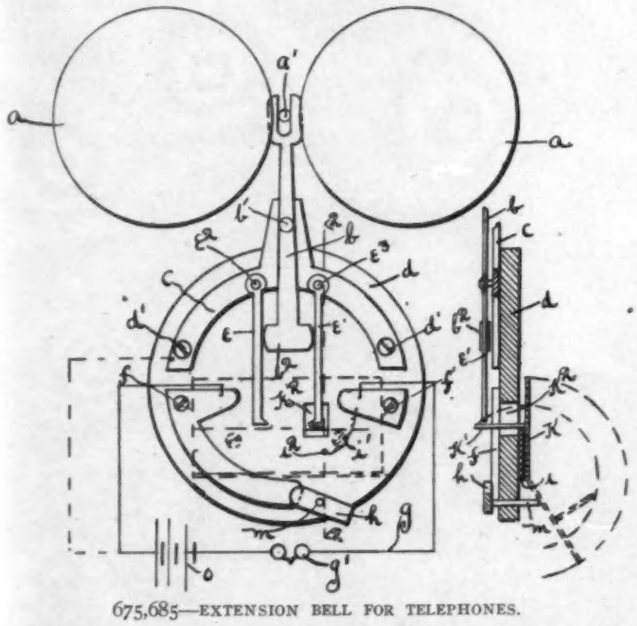


675,467—TELEPHONE SPEAKING TUBE.

lever, whose toe is thereby forced out against a projection c^3 on the drop to raise the letter into engagement with the latch E. In one form shown the jointed part of the toggle lever falls behind the tip portion of the plug when fully inserted, and is raised when the plug is withdrawn as well as when it is inserted.

675,378—C. E. Egan. Pay Telephone.

This is a toll box for attachment to the front of a magneto phone, so arranged that the user recovers his coin if the desired connection cannot be had. The chute E leads down past an opening H in the box to a return re-



675,685—EXTENSION BELL FOR TELEPHONES.

ceptacle F. When the coin is first deposited it falls between springs e, only one of which is shown, and rests on a plunger head K, the springs being included in the generator circuit, and the coin completing that circuit so that a call can be sent. When the receiver is taken down for use, the hook lever V rises, permitting spring W to force frame P-M outward, carrying back plunger head K and allowing the coin to fall and rest upon a projecting finger X on armature of magnet a. This magnet is included in a ground circuit completed by push button h, and having current sent through it from central by the operator at will. If the connection is obtained conversation proceeds, and at its termination the hanging up of the receiver depresses lever V, pulls back the frame and plunger K and knocks the coin through opening H into the box. If the connection cannot be obtained the magnet a is energized to permit the coin to fall through the chute and out into receptacle F.

675,467—H. A. Cutmore. Telephone Speaking Tube or Like Receiver.

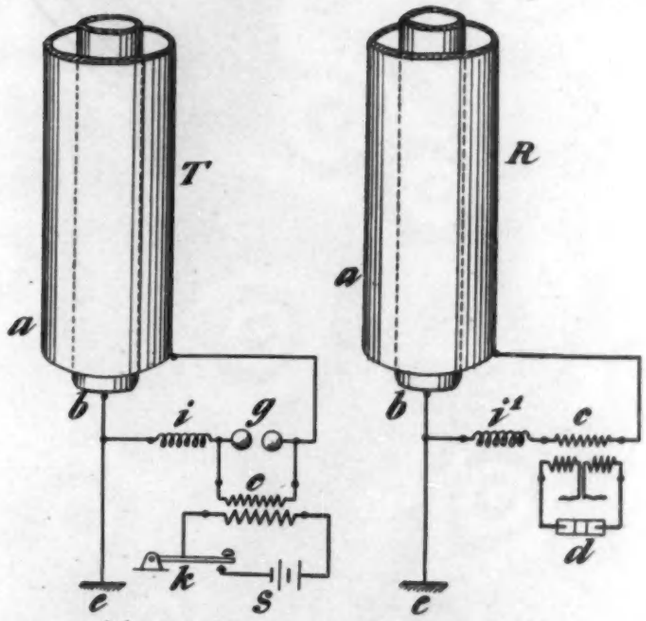
This is a non-collapsible rubber cushion for receivers to fit the ear and exclude external noises. It is made in two parts, A and B, of soft rubber, fitted together to form an air chamber J, and with a metal throat or funnel K.

675,685—V. J. Van Horn. Extension Bell for Telephones.

This is a contrivance worked by the clapper of a polarized ringer to close the circuit of an auxiliary bell. The clapper vibrates a lever b, which in turn throws out the pivoted pendulum levers e and e′ to make contact with parts f and f′, thereby closing circuit of bell g′ through battery o. When the main ringer comes to rest the pendulums drop down and break the local circuit. A drop K may also be tripped, and if switch h is turned to close on segment f the local circuit will remain closed until manually restored.

June 11.

676,332—G. Marconi. Apparatus for Wireless Telegraphy.



676,332—APPARATUS FOR WIRELESS TELEGRAPHY.

This invention involves a change in arrangement of the conductors in Marconi's system, as well as the inclusion of syntonizing means. He proposes using two sending and receiving conductors instead of one, carefully insulated from each other, and either concentric or parallel. He also sets out the advantages gained by including in the aerial circuits at both transmitting and receiving stations of inductances preferably employing (especially at the transmitting station) inductance coils capable of wide variations of self induction, whereby the resonances of the corresponding stations can be harmonized and the receiving apparatus caused to readily respond to the oscillations sent from the transmitting station.

"I am much pleased with your paper and do not see how I could do without it.

H. ORAN HENLY,
Carthage, Ind."

THE WISCONSIN STATE CONVENTION.

CONVENTION HALL.

The summer meeting of the Wisconsin Independent Telephone Association was held in the city of La Crosse, Wis., on June 25, 26, 1901.

The first session was called to order June 25 at 10 a. m. by President A. L. Hutchinson of Weyanwega. Mayor Boschert of La Crosse delivered the address of welcome and gave the visiting telephone men the keys of the city.

President Hutchinson responded by saying that the convention was glad to be able to meet in La Crosse and thanked Mayor Boschert for the royal welcome extended the telephone men. He referred to the strength of the organization in recent years and the large number of Independent companies that are continually starting in this state.

A. L. HUTCHINSON.

WILLIAM LOHMILLER.

Mr. W. E. Doolittle made a short address on the National Association convention recently held in Buffalo. Capt. I. H. Moulton also spoke of this meeting and of the important work being done by the National Association. On motion Mr. H. B. McMeal, editor of TELEPHONY, was made an honorary member of the State Association. Then the delegates, under the care of Messrs. I. H. Moulton,

LAUNCHES "BESSIE B" AND "NUMBER 44."

president of the local Independent company; C. H. Schweizer, vice-president of the association, and William Lohmiller, secretary of the local company, visited the new La Crosse club rooms and the newly remodeled central station of the La Crosse Telephone Company.

At the afternoon session President Hutchinson delivered his annual address, which touched on the status of the Independent movement in Wisconsin. He also gave advice as to how he thought a telephone exchange should be conducted and what was necessary to make a success of the Association.

Mr. R. S. Abbott read a paper on "Tolls and Toll Lines," which was listened to with much interest. The paper was discussed by Messrs. Valentine, Teasdale, Hackney, Nate and Slater. After the meeting adjourned the delegates, as guests of the La Crosse Telephone Company, were given a trolley ride around the city, a steamboat ride on the Mississippi and a banquet at the La Crosse Hotel, at which Mr. Hutchinson acted as toastmaster. Toasts were responded to by Messrs. Moulton, Nate, Doolittle, Wenter, Abbott, Hackney, Valentine, Schweizer, Burch, Harper and McMeal.

The second day's business was commenced at 9 a. m. A committee on resolutions was appointed composed of Messrs. Harper, Slater and Dougherty.

DELEGATES FROM THE FARMING DISTRICT.

A general discussion on rates was indulged in by Messrs. Slater, Bell, Hutchinson, Valentine, Hackney, Abbott, Harper and Veeder.

Mr. L. W. Burch then read a paper on "Practical Line Construction."

A committee was then appointed to determine upon some uniform system of toll rates to be adopted by all companies.

Resolutions were adopted criticising the telephone and electrical journals (excepting one) for not having representatives present at the association meetings. A resolution of thanks was tendered the La Crosse Telephone Company, the La Crosse and South Eastern Telephone Company, the Vought-Berger Company, the La Crosse Street Railway Company, Captain W. W. Cargill, the citizens of La Crosse and the mayor and city officials for their cordial entertainment and hospitality. The convention then adjourned to meet in Milwaukee next February. After adjournment the delegates were given a carriage ride around the city through kindness of the citizens of

La Crosse. In the evening the delegates visited the Vought-Berger factory and were given a launch ride up the Mississippi by the Vought-Berger Company, the launches "Bessie B" and Bushman's "Number 44" carrying the party. Most of the delegates enjoyed the luxury of a swim in the Father of Waters. The launch ride ended an enjoyable two days' convention and outing. Before leaving for home the delegates expressed their warm appreciation of La Crosse hospitality and felt especially indebted to Messrs. Moulton, Lohmiller, Schweizer, Vought, Berger and Cargill.

THE VOUGHT-BERGER COMPANY.

The Vought-Berger Company of La Crosse, Wis., manufacturer of telephones, switchboards and exchange equipment, is one of the latest companies to enter the Independent telephone manufacturing field. The officers of the company

M. I. VOUGHT.

MARCY BERGER.

are M. I. Vought, president; Clark Thompson, vice-president, and Marcy Berger, secretary and treasurer. Mr. Vought is well known in the electrical and telephone field as an engineer of wide experience. He is the inventor of the "Two Ball" adjuster for hanging electric lights, which device is in use in almost every city in the Union. He is also the inventor of the Vought hanging telephone as well as other apparatus manufactured by the Vought-Berger Company. Mr. Berger, while comparatively new in the telephone field, is a man of keen business acumen who has made a careful study of the telephone manufacturing business. Mr. Thompson is a prominent business man of La Crosse. The company is well officered, has large financial backing and is well equipped to manufacture telephone apparatus. The photographs of Messrs. Vought and Berger are reproduced herewith, as well as a general view of the company's building, offices and machine work department. The entire building is used by the company, whose apparatus is fully guaranteed in every respect. The company's hand telephone is meeting with warm favor by exchange managers generally. Besides the hand telephone the company manufacture a complete line of telephone apparatus, including wall and desk telephones, switchboards, intercommunicating systems, etc., as well as carrying a complete stock of telephone and electrical supplies. Correspondence is invited from prospective purchasers of telephone equipment or supplies.

FACTORY VOUGHT-BERGER COMPANY.

GENERAL OFFICES VOUGHT-BERGER COMPANY.

MACHINE WORK DEPARTMENT VOUGHT-BERGER COMPANY.

The Independent Telephone Manufacturing Company of 224-226 South Clinton street, Chicago, report a very heavy volume of business. The company is working a night force in its switchboard and telephone department, and additional machinery is being installed in its factory in order to properly take care of the increased business. The company has furnished several exchanges with complete line of apparatus. One of the company's latest intercommunicating systems has been placed in the offices of the Continental Casualty Company, Chicago. Prospective purchasers of telephone apparatus are requested to write for advertising matter and prices.

THE LA CROSSE TELEPHONE COMPANY'S EXCHANGE.

The La Crosse (Wis.) Telephone Company is one of the successful institutions of the city of La Crosse. It received its certificate of incorporation from the secretary of state in February, 1893, but waited two years before commencing construction, in the forlorn hope that the Wisconsin (Bell) Telephone Company would reduce its rates and improve its service. Finding the Bell Company would do nothing to improve the existing conditions, Mr. William Lohmiller, the promoter of the company, called a meeting in May, 1893, and the organization of the new company was completed. The old (Bell) company had at this date about 370 subscribers at rates of $4 per month for business and $3 for residence telephones. The new company's rates were fixed at $2.50 per month for business and $1.50 for residence telephones. The construction work on the new exchange was completed in four months, and its service was started with 410 subscribers. The original rates have been maintained ever since and the exchange has grown until now service is being given to nearly 800 subscribers. During the past year the company has largely increased the capacity of its plant, laying several miles of underground cable. This work will be completed within the present month and will provide for the serving of 2,000 subscribers. The switchboard in use is of Western Telephone Construction Company make, while the terminals and cross connecting boards were installed by the Sterling Electric Company of Lafayette, Ind. The exchange room is provided with every modern convenience, a special lounging room being provided for the operators.

La Crosse has been the fighting ground of the Bell Company. When the new company was fairly started rates were reduced to $1 per month for residence and $1.25 for business telephones, with a great number of free telephones. Everything was done that would tend to cripple the home company, but notwithstanding this method of warfare the home company continued to grow and prosper.

The stock of the La Crosse Telephone Company is held by business men of the city, not a share being held by outsiders. The capital stock is $50,000, on which quarterly dividends of 2½ per cent are being paid. The officers of the company are: Messrs. I. H. Moulton, president; W. W. Cargill, vice-president; William Lohmiller, secretary, treasurer and general manager. The above, with Mr. Frank P. Hixon and Mr. George H. Gordon, comprise the directors. Mr. George L. Saunders is manager operating department, Miss Clara B. Thompson is chief operator and Miss Jennie Erwin is assistant chief operator.

EXCHANGE ROOM, LA CROSSE (WIS.) TELEPHONE COMPANY.

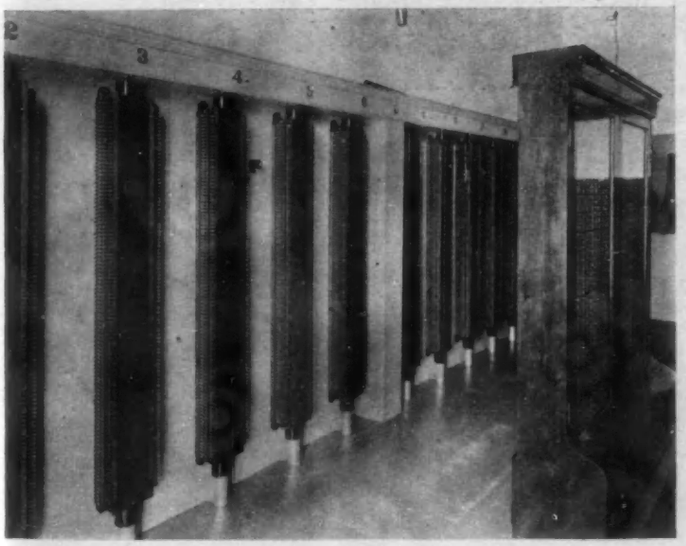
Another prominent La Crosse institution is the La Crosse & Southeastern Telephone Company, which operates 180 miles of toll line from La Crosse to Wonewoc, via Viroqua, Viola and Hillsboro, and from La Crosse to Sparta, via West Salem, Bangor and Rockland. The officers of the company are: William Lohmiller, president; J. George Schweizer, treasurer, and Charles H. Schweizer, secretary.

COMMON BATTERY TRANSMITTERS.

In the designing of a common system it is, of course, necessary to have all the current thrown out on the line that is possible, in order that the longest lines may operate efficiently. To do this requires a circuit with all the apparatus

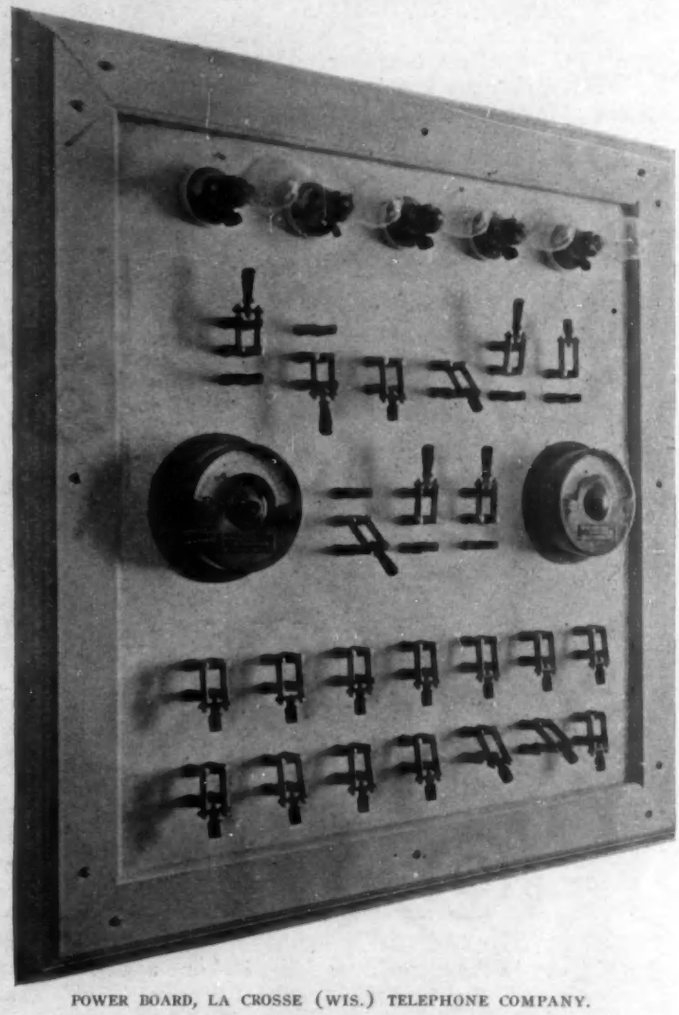
MANAGER'S OFFICE, LA CROSSE (WIS.) TELEPHONE COMPANY.

in series of a very low resistance, and also sufficient voltage in the battery. The receiver where the battery does not pass through it may be from 60 to 100 ohms resistance, and where



TERMINAL ROOM, LA CROSSE (WIS.) TELEPHONE COMPANY.

it is in the battery circuit about 20 to 25 ohms. The transmitter is the most important part of the system, as it should work efficiently on a very small amount of current. The transmitter should also be able to stand all the current that will pass through it on the shortest line. It should be so constructed as to permit a very wide variation in resistance. While talking the variation should be so great that the transmitter should introduce a greater resistance than the line itself where the line is of ordinary length. Of course, it is possible that the resistance may become so great that not sufficient current will flow in the circuit and the transmission will be poor. It has been found that a transmitter of about 80 ohms normal resistance produces the best results for general purposes. This transmitter should be capable of increasing to as high as 400 ohms, or even higher, with a certain pitch and amplitude of vibration. It is a great mistake to introduce any carbon of high resistance, either in



POWER BOARD, LA CROSSE (WIS.) TELEPHONE COMPANY.

the electrode or the granules, for that is simply a dead resistance which is not variable and is as bad as if it were in the line. The resistance must come in the contact of the carbon granules with each other and with the electrodes, and unless this is the case it will avail nothing to have a high resistance transmitter. There is less danger of having too little current due to a high variable resistance of the transmitter than there is to a high but unvariable resistance. What is needed is to produce a great change in the amount of current flowing. If it is a small current which changes a great deal the apparatus can be designed to take care of that part. Each part of the system should be designed to work with all the other parts. A transmitter may work poorly, when, if the apparatus was designed for it, there would be a good performance.

"I can say for your publication that it has no equal here or abroad that I ever saw.

ARTHUR CULVER,
Yale, Iowa."

THE SUMTER TELEPHONE MANUFACTURING COMPANY.

A manufacturing enterprise of the South that is attracting considerable attention is that of the Sumter Telephone Manufacturing Company, located at Sumter, S. C.

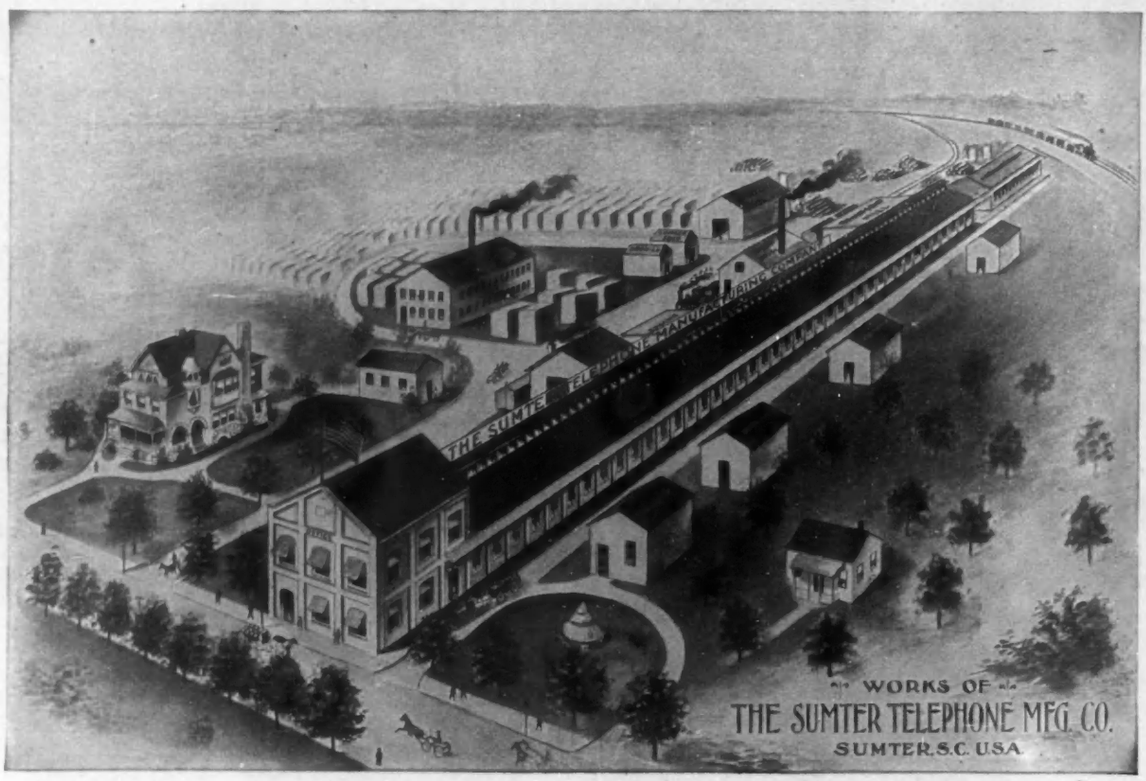
The manufacture of telephones has been identified with the city of Sumter for the past seven years, the business having been originally established by Mr. C. T. Mason about the year 1894. The Sumter Telephone Manufacturing Company, of which Mr. C. T. Mason is the vice-president and general manager, was organized in the fall of 1899, and this company is now one of the largest and best equipped telephone manufacturing corporations in the United States. The officers are: Col. R. M. Wallace, president; Mr. C. T. Mason, vice-president; Mr. F. C. Manning, secretary, and Mr. C. G. Rowland, treasurer.

Mr. Manning has been identified with the telephone business for a number of years and has been associated with Mr. Mason in the manufacture of telephone apparatus since the spring of 1897, and as a result of their wide experience and the excellent facilities of this company, it is now producing a line of high-grade telephone equipment, and its telephones and switchboards are in use in many hundred exchanges.

The Sumter Telephone Manufacturing Company enjoy the advantages of a very complete factory equipment and make practically everything entering into the construction of its large line of apparatus. Its machinery department is completely furnished with the latest and best types of machines, embodying many automatic and labor-saving tools. The main factory building is 470 feet long, there being 30,000 square feet of floor space, and the arrangement of departments such that each is separate and distinct. Large sub-die and punching power presses are used for the stamping of all metal parts and for the manufacture of tools, dies, etc., a perfectly equipped tool-making department is provided.

A feature of the Sumter instruments which always attracts attention is the magnificent finish given the woodwork. The wood is sawed upon the company's own band saw mill, which is in connection with its large plant, and all wood parts are manufactured from lumber produced right from the log. These logs are secured from the timber forests of South Carolina, and the woods principally used are white oak, walnut and sweet gum. The oak is quarter sawed, and from the gum, which is cured by a special process, the company manufacture a beautiful imitation mahogany. The walnut being of southern growth, is very beautiful, the grain being large and prominent. The company has excellent facilities for carefully seasoning all lumber before it is worked into the various cabinets, and the finishing is done by skilled workmen and entirely by hand, which is the secret of the high "piano finish" as produced on all of its cabinet work.

The Sumter Telephone Manufacturing Company is turning out a line of telephones adapted to either local or long-distance service. It has equipped a large number of exchanges throughout the middle and southern states, and its business is rapidly increasing and extending to all parts of the United States and several foreign countries, as well as Canada and Mexico.



The following are among the exchanges recently equipped with the company's patented "Bullseye" express type switchboard of from 100 to 300 drops' capacity: Maryville Telephone Company, Maryville, Tenn; Wilkesboro Telephone Company, Wilkesboro, N. C.; Dothan Telephone Company, Dothan, Ala.; Carolina Telephone & Telegraph Company, Washington, N. C.; Forest City Telephone Company, Forest City, N. C.; Chicasha Telephone Company, Chicasha, I. T.; Quitman Telephone Company, Quitman, Ga.

In addition to this the company recently furnished the Jacksonville (Fla.) Telephone Company with a six-hundred-number switchboard.

"I have been a constant reader of TELEPHONY for some time and regard it as one of the ablest edited journals in the field and I am always pleased to receive it.

J. B. RHODES, Gen'l Mgr.,
Zanesville Telephone Co.,
Zanesville, Ohio."

MONARCH TELEPHONE MANUFACTURING COMPANY.

Among the late manufacturing concerns whose product has come into general favor is the Monarch Telephone Manufacturing Company, 39-45 West Randolph street, Chicago, who manufacture a complete line of telephone and exchange supplies. The company make a specialty of generators, extension bells, transmitters, receivers, ringers and protective devices. Mr. J. E. Norling is president of the company, Mr. E. E. Yaxley, treasurer and general manager, and J. C. Hubacher, vice-president and secretary. Mr. Yaxley has

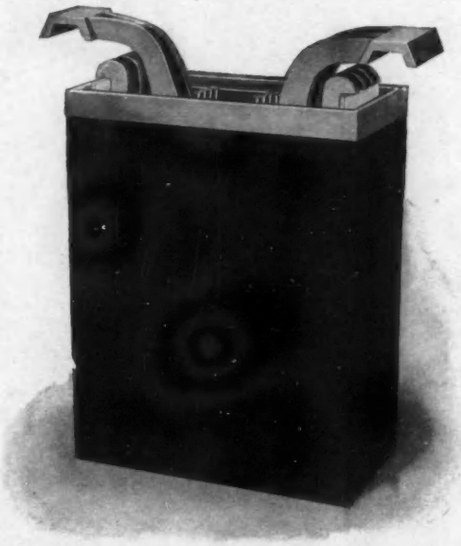
E. E. YAXLEY.

J. C. HUBACHER.

had an experience in the telephone manufacturing business covering a period of fifteen years, during which time he has been with some of the most prominent telephone manufacturing companies and has designed and built a great deal of telephone apparatus. Mr. Hubacher is a mechanical engineer of marked ability, with a wide experience in the manufacture of telephone and kindred apparatus. The company is well equipped, both as regards engineering and mechanical talent, and its product should meet with the approval of critical buyers.

AMERICAN STORAGE CELLS.

The American Battery Company, 172-174 South Clinton street, Chicago, reports a heavy demand for its storage cells for telephone exchanges. The American type C. cell



AMERICAN BATTERY COMPANY'S TYPE C. CELL.

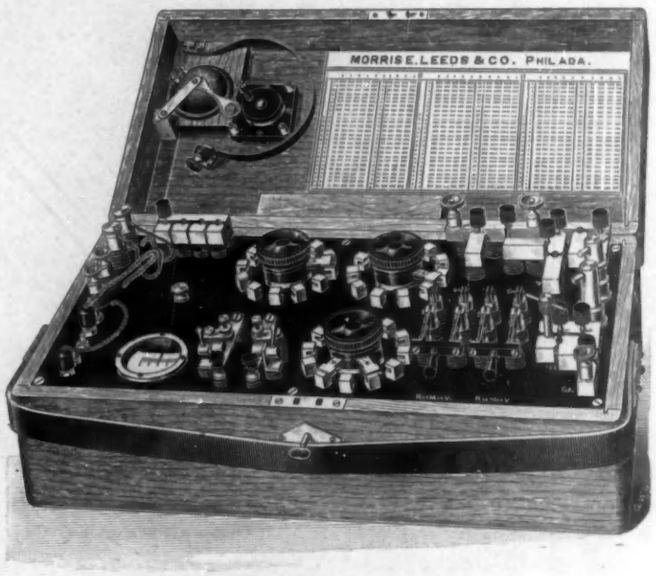
is herewith illustrated. It is claimed by the company to be in use in over two hundred central battery telephone exchanges. The company has just issued its latest descriptive circular and price list of its product, which will be sent to anyone interested upon request.

APPARATUS FOR TESTING TELEPHONE CABLES.

As part of the "up-keep" of a modern telephone exchange it is necessary to have accurate instruments for testing underground and overhead cables as well as ordinary open lines. Mr. Henry W. Fisher, superintendent of the Pittsburg factory of the Standard Underground Cable Company, has had occasion to make a great many tests of telephone cables during the process of manufacture and afterward, and in consequence has given the subject very careful attention. Co-operating with Morris E. Leeds & Co. of Philadelphia, Mr. Fisher recently designed a very complete and convenient portable cable testing set, which is herewith illustrated. It is arranged for testing capacity, insulation and conductivity as well as for locating faults by various methods, such as the Murray and Varley loop tests.

A method new to portable outfits has been introduced for locating breaks in cables where the conductor has parted, and also arrangements are made for the use of a telephone for measuring capacity without the use of a galvanometer.

In the Wheatstone bridge a marked variation from



FISHER TESTING SET.

the usual commercial type has been made. It is an extension of the Kelvin-Varley apparatus and is extremely well suited to the work contemplated.

For making the different classes of measurement it is not necessary to change the connections, as this is accomplished instantly by means of special double-throw switches provided for the purpose. As Mr. Fisher himself has had more experience with this instrument than anyone else, the following statement from him will be of interest to telephone engineers:

"In designing it my main endeavor was to obtain a testing set which almost anyone could learn to operate in a short time, and by means of which measurement could be made rapidly and with little chance of error. We use the set for locating crossed or broken wires that occur in telephone cable cores during the process of manufacture.

"The testing set is kept in the laboratory and is taken to the cabling department when needed.

"One of my assistants located the first few faults with it and the foreman of the cabling department, who is in no sense an electrical engineer, learned to operate it the first time he saw it used. He taught the use of it to a day-turn machine boy and to the night foreman.

"These operate it now with uniform success and in lengths of cabling running as long as 4,000 feet are always within four feet of the location of crossed wires, and while of course broken wires cannot invariably be located as

closely as the above, yet the work is done sufficiently good for practical purposes and much better than it formerly was done by means of a reflecting galvanometer.

"One of the local telephone companies had a long length of cable that was in trouble and which, on account of polarization and ground currents, they were not able to locate. At their urgent request I took one of my assistants and the No. 2 testing set and rapidly tested most of the wires for insulation resistance, thereby selecting some good wires to use in the loop test, and also discovering that the wires which did not go to the distant end of the cable were all right, thus ascertaining that the fault must be between the end of said good wires and the far end of the cable.

"The Murray loop tests were then applied rapidly and the fault located thereby. The total time taken up in testing the wires for insulation resistance and locating the fault was not much over one-half an hour and in all about seventy-five tests were made.

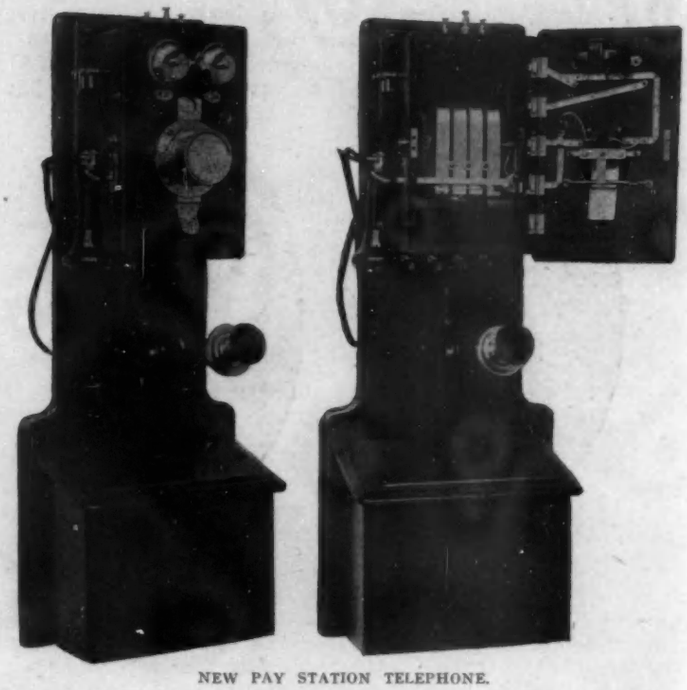
"This proved the great practical value of this instrument for testing and locating faults in cables, and I realized then more than ever that I have never seen nor used testing apparatus which could be operated with such great rapidity and certainty of success. The uniform accuracy with which faults are located proves that the resistance coils of the set have been very carefully adjusted, and therefore M. E. Leeds & Co. have cause for congratulation on their excellent workmanship and accurate adjustment of the various resistances, etc."

The Fisher testing sets are placed on the market by Mr. James G. Biddle, 1020 Stephen Girard building, Philadelphia, who is sole selling agent for Leeds & Co. Mr. Biddle has had occasion to supply cable testing outfits to many important customers, among which may be mentioned the Central Union Telephone Company, Chicago; Delaware and Atlantic Telegraph and Telephone Company, Philadelphia; Postal Telegraph Cable Company, New York; New York Telephone Company, New York City; Cataract Power and Conduit Company, Niagara Falls; U. S. Signal Corps, Washington, D. C.; Pennsylvania Telephone Company, Harrisburg; Electrical Commission, Baltimore; Standard Underground Cable Company, Pittsburg; Perth Amboy & Son, San Francisco; Safety Insulated Wire and Cable Company, New York; Maryland Telephone and Telegraph Company, Baltimore; New York and Pennsylvania Telephone Company, Elmira; Columbus Citizens Telephone Company, Columbus, Ohio; Crehore-Squier Intelligence Transmission Company, Cleveland; Bell Telephone Company, Philadelphia; Nova Scotia Telephone Company, Halifax, etc.

Catalogue No. 360 describes the Fisher Testing Sets in detail with accessory apparatus. Any one interested in the subject can secure a copy of the catalogue without charge (provided this journal is mentioned) by writing to Mr. Biddle, who makes a specialty of supplying testing instruments for telephone exchanges.

A NEW PAY STATION TELEPHONE.

The Durham Telephone Manufacturing Company of Durham, N. C., has recently put on the market a new pay station telephone device which is meeting with marked favor. It differs from most pay station or prepayment devices in that the coin can be given back to the calling subscriber in case the connection is not secured. In an ordinary prepayment telephone there is often an annoying delay while the calling subscriber puts in his coin before the central office completes connection. With this device the delay is done away with by having the calling subscriber drop the coin in the slot before the central office can be called. Normally the generator circuit is open, and no calling can be done without putting in the coin, which closes the circuit. If the connection is completed and conversation secured the hanging up of the receiver knocks the coin down into the strong box. If, however, the connection is not given, the central office so informs the caller and closes a circuit so that when the subscriber presses a button to complete another part of the circuit the coin is thrown out into the open receiver in front of the telephone. Now that prepayment systems and other methods calculated to do more justice to both stockholders and public are coming in, this device is of particular value. The device



NEW PAY STATION TELEPHONE.

is the invention of Mr. C. E. Egan, general manager of the Durham Company. It might be noted that the company manufactures a complete line of telephone equipment and is compelled to work night and day to fill orders promptly. Correspondence is solicited from prospective buyers of telephone apparatus.

NEW TELEPHONE LINE APPLIANCES.

The cable clip illustrated by Fig. 1 is made of a single piece of zinc, and will accommodate, it is said, the several

FIG. 1—CABLE CLIP.

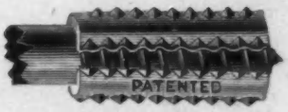


FIG 3—EXPANDING SLEEVE.

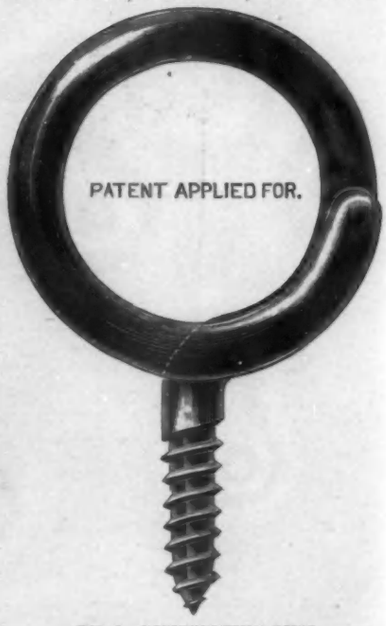


FIG 2—DISTRIBUTING RING.

different sizes of telephone cables; the engraving showing a full-size hanger gripping a three-quarter-inch cable. As will be noticed, the hanger is very simple and quickly

applied. The circular enlargement at one end of the hanger is held against the cable, and the free end is wound around and passed through the lower slot, around the cable again, through the upper slot, up over the suspension wire and hooked into the upper slot, as shown. The free end may also be passed once around the cable, then through the lower slot, passing up over the suspension wire and hooking into the upper slot. Fig. 2 shows an insulated bridle or distributing ring for telephone wires. It is made of iron, heavily coated with enamel, and the wires are inserted or withdrawn at the opening on the side. When applied to brick, stone or iron work an expanding sleeve (Fig. 3) is provided into which the bridle ring screws directly, the shield expanding at the inner end, and holding the ring rigidly in position. All three appliances are made by James S. Barron & Co., 24 to 30 Hudson street, New York.

TRADE NOTES.

MATHIAS KLEIN & SON, Chicago, report that the company has never been so busy in its history. Ask for Klein's "Red Book," which will be sent on request.

THE ACME ELECTRIC COMPANY, Chicago, reports a good demand for its magneto bells. The company's catalogue, describing its entire product, will be mailed on request.

S. B CONDIT JR. & CO., Boston, Mass., have ready for mailing their "Blue Book," which illustrates and describes the company's product. It will be sent to any address for the asking.

THE DEARBORN ELECTRIC COMPANY, Chicago, invites correspondence from prospective buyers of telephone or electrical supplies and promises prompt shipments of all orders received.

THE HAINES & NOYES COMPANY, Chicago, is sending out some very attractive advertising matter encased in a giant fire cracker. The company will send this novelty to any address upon request.

THE SUN ELECTRIC MANUFACTURING COMPANY, Philadelphia, reports a largely increasing business every month and would be pleased to send its latest telephone catalogue upon request.

THE CHICAGO TELEPHONE SUPPLY COMPANY, Chicago, is mailing a few extracts from letters which lead the company to believe that Chicago telephones satisfy. This booklet will be sent on request.

J. J. REIDY & CO., New Haven, Conn., is making a very liberal offer to further introduce the Donnelly climbers, which are warranted equal to any made. The company will submit its new proposition upon request.

THE ELECTRIC APPLIANCE COMPANY, Chicago, is putting out a new dry battery under the well-known name, "Eaco," which it especially recommends for telephone work and where heavy service is required.

THE CHASE-SHAWMUT COMPANY, Boston, Mass., wants to know why you don't use the Boston Cable Clip. The company says there are millions of these clips in use and will tell you why you should use them, too, if you write and ask.

THE ELECTRIC APPLIANCE COMPANY, Chicago, is sending out Mr. S. A. Dinsmore's "Practical Telephone Manual," a book of nearly one hundred pages of practical information for telephonists. Those wanting this manual should write the company.

THE WILLIAMS-ABBOTT ELECTRIC COMPANY of Cleveland, Ohio, has just issued a new catalogue "A" which illustrates and describes the complete line of apparatus manufactured by the company in the new telephone center—Cleveland. It contains halftone portraits of the officers and department managers of the company, views of the factory and departments, as well as some interesting views of Cleveland. Some practical hints are given on installation and equipment, and, as a whole, the publication is a creditable one. Those so desiring may secure a copy by addressing the company.

THE SUMTER TELEPHONE MANUFACTURING COMPANY, Sumter, S. C., has prepared a series of leaflets describing the company's apparatus. These leaflets are being distributed now and will be mailed to anyone upon request.

M. B. AUSTIN & CO., Chicago, will send to everyone who asks for it a copy of the company's latest pocket telephone supply catalogue, which will be found of unusual interest. The company's large stock of telephone and electrical supplies enables it to fill all orders direct from stock. Correspondence is solicited.

THE NORTH ELECTRIC COMPANY, Cleveland, Ohio, is mailing some unique advertising matter and novelties to telephone users. Mr. F. F. Sapp has prepared the many good things sent out in an advertising way by the North Company, and in order that you do not miss anything it might be well to get on Mr. Sapp's mailing list.

THE WILHELM TELEPHONE MANUFACTURING COMPANY of Buffalo, N. Y., is mailing out circular matter describing its long-distance bridging and toll line telephone number 3. The company makes some strong claims for this instrument and prints letters from purchasers showing the popularity attained by "Wilhelm" apparatus.

THE STANDARD TELEPHONE AND ELECTRIC COMPANY of Madison, Wis., reports a favorable increase in business in all departments. The demand for the company's new "Eclipse" switchboard is especially strong. This board is substantially constructed and its ease and rapidity of operation makes it a desirable piece of modern exchange equipment.

THE EUREKA ELECTRIC COMPANY, Chicago, is now distributing its special telephone supply construction material catalogue, which is a most complete and interesting book. The company will also be pleased to send to purchasers its regular telephone catalogue, embracing the large line of Eureka guaranteed apparatus. The company will send for the asking one of its number one special transmitters, made up in an attractive manner for a watch charm.

THE MANHATTAN ELECTRICAL SUPPLY COMPANY of New York and Chicago is calling the special attention of telephone companies to its well-known Mesco battery. This battery is being sold to the largest telephone companies in the United States, and has been giving general satisfaction. While the price has been materially reduced, the high quality of the battery has been maintained. Those desiring high-grade batteries are requested to write the company for descriptive matter and prices.

THE WARNER ELECTRIC COMPANY of Muncie, Ind., will send, postage prepaid, the June, 1901, issue of its catalogue, which, besides describing the well-known Warner apparatus, gives a lot of valuable data. The book contains a number of diagrams, table of weight and resistance of wires, carrying capacity of poles, telephone troubles, questions and answers, glossary of electrical terms, etc., and will be found of value for reference. Warner apparatus is installed in over eighteen hundred exchanges and giving universal satisfaction.

THE AMERICAN ELECTRICAL TELEPHONE COMPANY, Chicago, reports the following among recent contracts for telephone plants: Mansfield, Ohio, common battery, 1,200 lines installed, with provision for 3,000. Reading, Pa., 1,500 lines installed, with provision for ultimate capacity of 5,000; Zanesville, Ohio, 1,200 lines installed, ultimate capacity, 3,000. Huntington, Ind., 800

lines installed, ultimate capacity, 1,500. Austin, Texas, 1,200 lines connected, ultimate capacity, 3,000. Temple and Tyler, Texas, 600 lines connected, ultimate capacity, 1,500. Xenia, Ohio, 600 lines in operation, capacity for 2,000. Oklahoma City, I. T., 750 lines connected, 1,200 line switchboard installed.

THE AMERICAN ELECTRIC FUSE COMPANY of New York, Chicago and San Francisco has just perfected a new fuse, which it claims to be the best on the market to-day. This fuse resembles in appearance the old style of fuse, manufactured by the company, but the fuse wire is inclosed between two pieces of mica, absolutely preventing any possibility of breakage. The fuse wire is left loose in the middle of the fuse, so that it fuses more actually, it is claimed, than does any other fuse ever manufactured of its kind.

The fuse wire, which is the only delicate part of the fuse, is inclosed entirely and protected against any possibility of damage. The fuses are furnished in any amperage desired for telephone work, either in Western Union or Postal style, at three-fourths of a cent each, 50 or 100 being packed in a box, which is carefully labeled and packed.

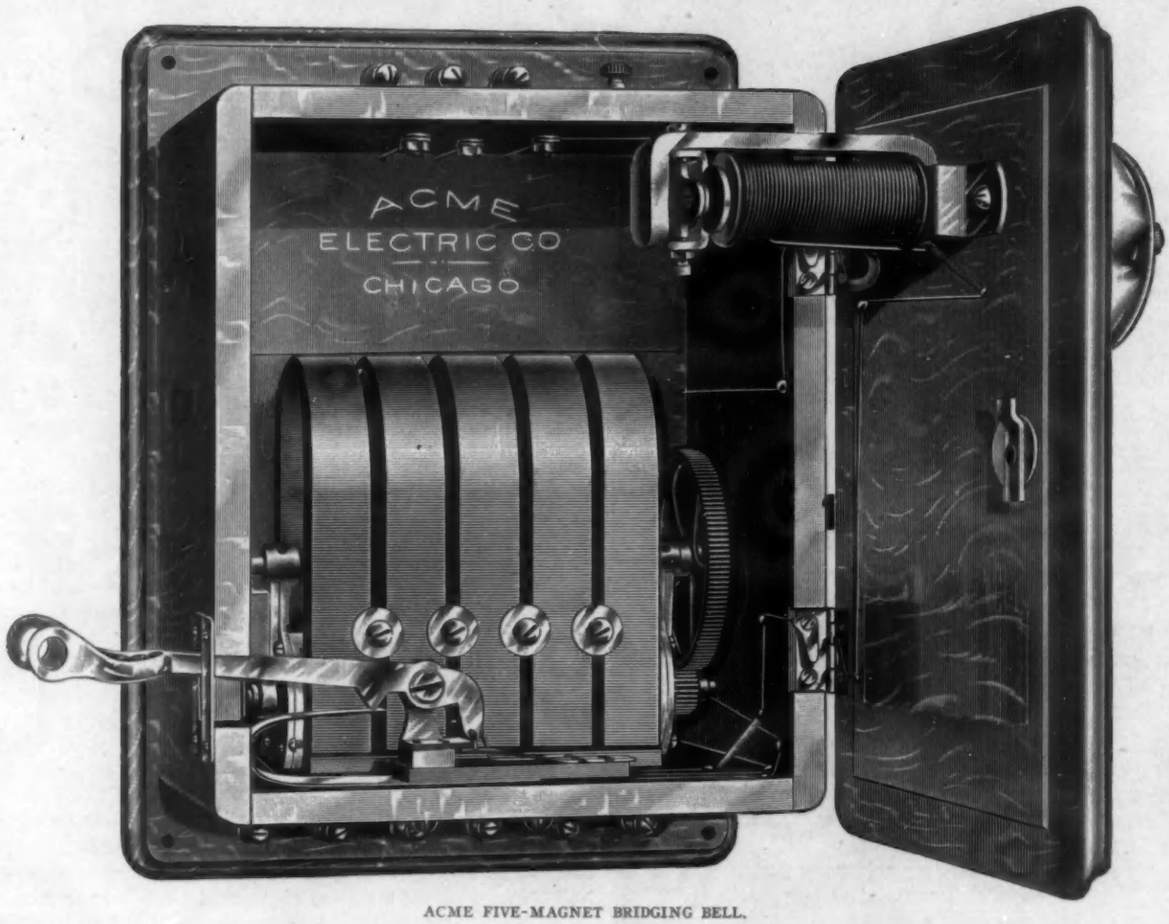
Tests with a box of these fuses have been made after tossing the box about and playing ball with it for fifteen minutes, and every fuse was found to be perfect and uninjured, despite the rough handling it had received. The fuses may be stamped on, stepped on, pushed roughly into place or handled in almost any manner without the slightest injury. They may be bent almost into the form of a bow and will go back to their proper place without any damage.

The company has made a large number of tests in order to secure the perfection of this device, and takes great pleasure in announcing that samples of these fuses are now ready for the market. No fiber or like substance is used in any way in connection with these fuses. They are absolutely moisture-proof, indestructible and will last a lifetime, unless burned out.

THE ACME ELECTRIC COMPANY.

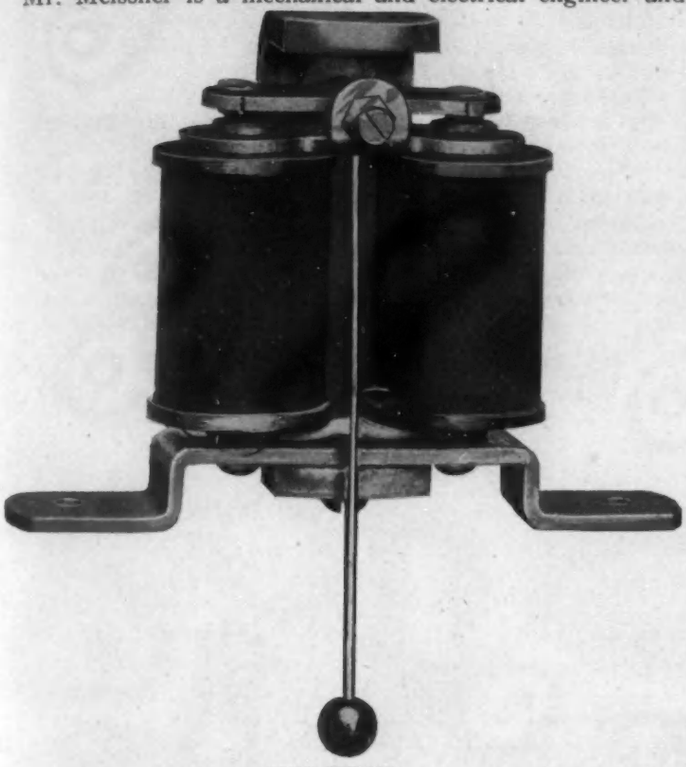
The Acme Electric Company of 233 South Canal street, Chicago, is one of the younger telephone manufacturing concerns which has forged rapidly to the front under the able management of Mr. W. O. Meissner, the company's president and general manager. Mr. Meissner entered the telephone manufacturing field when a comparatively young man and has devoted his entire time to the study and construction of modern telephone apparatus. He has the distinction of being the first man to build telephone switchboards (for Independent use) in the West. These switchboards were built by the Washington Electric Company in 1894, of which company Mr. Meissner was founder and principal owner. The Washington Electric Company was

W. O. MEISSNER.



ACME FIVE-MAGNET BRIDGING BELL.

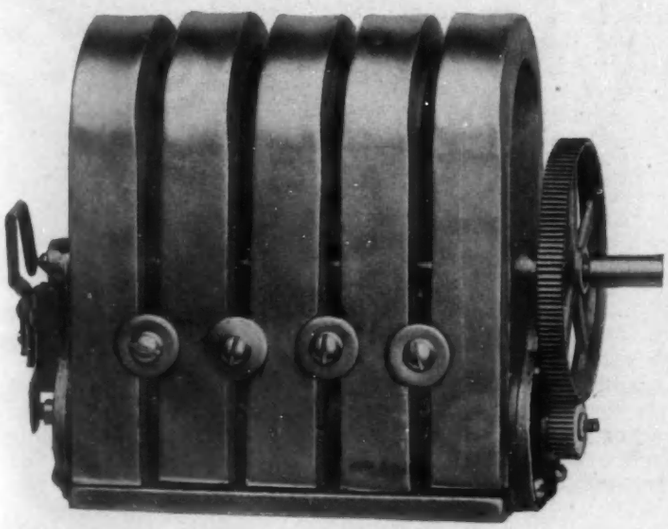
afterward merged into one of the most prominent telephone manufacturing companies, Mr. Meissner becoming general superintendent, which position he held until the present Acme Electric Company was organized through his efforts. Mr. Meissner is a mechanical and electrical engineer and



ACME STRIKER.

is the inventor of a great number of pieces of telephone and electrical apparatus and specialties.

Some of the products of the Acme Electric Company are herewith shown. The Acme five magnet bell is one for which the company claims many points of superiority. It is meeting with favor wherever used and is constructed to meet the requirements of the most exacting service. The



ACME FIVE-MAGNET GENERATOR.

striker shown is the one used in all the company's bells and contains a number of novel and useful features. The illustration of the company's five magnet generator shows this piece of apparatus unmounted. Aside from the bells, the company is manufacturing a complete line of telephone apparatus and will send its latest catalogue with full description and prices of the entire line of apparatus manufactured. Correspondence is invited from prospective buyers.

A VIEW OF CORPORATIONS FROM THE STANDPOINT OF THE STOCKHOLDER.

BY GRANT NEWELL.

ARTICLE VII.

In several instances occurring in the course of this series of articles the writer has had occasion to refer in a casual manner to the subject of eminent domain. The importance of this matter, taken in connection with the object in view, is so marked that the writer feels quite unable to dismiss the discussion of damages to property without devoting more time and space to the consideration of the rules and principles governing the right of the public to appropriate for its use the property of private individuals, and with this to close his work so far as the same relates to damages to property rights.

It will be apparent to the thoughtful reader that the right of eminent domain presumes as a condition precedent to its exercise, the formation of a distinct and proper legal entity, that is, a person either natural or artificial, of whom the law will take cognizance, and also the securing by such legal person of a proper and sufficient franchise, for these steps are absolutely essential to the exercise of the right of eminent domain. Eminent domain, in its proper exercise, secures to the possessor of the right two advantages—first, the right to take property of other persons for its use upon payment of just compensation therefor, and, second, immunity from damages so long as the property taken or injured is made use of in the manner and for the purposes imported by the terms of the taking. Eminent domain is defined to be the right and power of a sovereign state to appropriate private property to particular uses, for the purpose of promoting the general welfare. (Lewis Em. Dom., Sec. 1.) This definition, as will be seen, excludes the right as to all corporations which have no public duties to perform, and in which the public generally have no special interest. We have already discussed the question of the public character of telephone companies, and have observed under what conditions such companies become "public" in the sense in which the word is here made use of. The leading case of Irwin vs. Great Southern Telephone Co., 37 La. An., page 63, settled this point, apparently without the need of further discussion, and we shall therefore proceed upon the assumption that telephone companies, as generally existing, are, in this regard at least, public corporations to the extent that they are invested with the power to exercise the right of eminent domain. This right is primarily vested in the law-making body of the soverign power, and is probably based upon grounds of public policy, by which we may understand is meant simply that policy which has for its object the obtaining of the greatest good to the greatest number.

Both the right and power of eminent domain being primarily vested in the legislature, it follows as a matter of course that the legislature may provide by enactment for the ways and means by which this right may be exercised. Thus we find in the different states various modes of procedure which are necessary to be observed in every case where this right is sought to be exercised. But in and as a part of every such statutory enactment must be the provision for just compensation. The allodial system of tenure or landholding in force in this country permits every man to be the *absolute* owner of his property, and, such being the case, even the soverign power cannot take his holdings or any right or interest therein for any purpose except upon making him due compensation therefor. So that this rule regarding just compensation is correct, final and absolute in these matters. We are to understand that the purpose of the right of eminent domain is to provide a means whereby, under proper circumstances, the property of an individual may be taken or made use of without his consent. Of course, in many cases an arrangement may be entered into between the corporation and the property owner by which, upon the conditions imposed, the company may make use of the property. But as it is by no means always possible to bring

about such arrangements, the right of eminent domain becomes a necessity. It is a well-settled principle of this branch of our law that the exercise of the right to come upon or pass over land, when the acts of such a nature are persisted in from day to day, and not merely on infrequent occasions, is regarded as the taking of property within the purview of the rule, and so it may be said that any interference with the free and perfect enjoyment by the owner of his estate amounts to a taking of his property, for this word "taking," used as we are now doing, does not mean an absolute appropriation of the beneficial use of the property in question, but rather the adoption of some beneficial interest therein or use thereof. Applying this test, we have no hesitation in coming to the conclusion that telephone companies are within the rule which requires just compensation to be made to the property owner, for the privileges exercised with reference to his property by such a corporation, when it sets poles and strings wires thereupon. When a telephone company erects its poles and strings wires it does so either over the private property of individuals or along and upon highways. With reference to the latter it has been repeatedly held that such acts constitute an additional servitude upon the highway, and that the telephone company in the exercise of its rights is subservient to an electric railway upon the same highway, and this, no matter whether the telephone company pays for the privilege or not (see Board of Trade Tel. Co. vs. Barnett, 107 Ill., 507, for example), and in the case just cited the court further held that even though the owner of the abutting property had dedicated a portion of his land to be used as a highway, he was nevertheless entitled to compensation from the telephone company for damage to his property by the erection of their wires and poles. While the courts of certain of our states have come to a different conclusion, by the fair weight of authority, the rule above stated is upheld as being the law. Thus far we have discussed both the setting of poles and the striging of wires as practically one and the same act, but the question whether the mere stringing of a wire over the premises of an owner, or along and past such premises upon the contiguous highway, is a damage to such owner, is not so conclusively settled. There is in such a case, as a matter of course, a technical trespass, but it is apprehended by the writer that even though the law will permit the maintenance of an action where merely nominal damages are shown, the jury in such a case would in all reasonable probability, unless specially directed by the court, find a verdict for the defendant company.

In certain recent cases there has been shown a tendency in some instances to draw a distinction between country roads and city streets as to their use by electric poles, and it is perhaps but fair to say that the setting of poles and stringing of wires upon and along a city street is fast becoming, as looked upon by the courts, no additional servitude for which the abutting land owner may sue for and recover compensation. (See C. & P. Tel. Co. vs. Mackenzie, 74 Md., 48; also Lockhart vs. Craig St. Ry. Co., 139, Pa. St., 419.) But it sometimes happens that the wires of the company are to be placed underground, and under such circumstances a different case arises. It would appear that there has been no direct adjudication on this point, but reasoning from analogy and from the well established principles of law, it would seem that the same rules should be applicable as to the case of poles and overhead wires. Where the franchise obtained by the company permits the laying of wires underground there can be no legal reason advanced, on principle at least, why the same general rules with reference to compensation to landowners should not apply.

It must be understood by the reader that it is possible within the scope of these articles to discuss only general principles. They are intended to serve rather as a hint to the stockholder than as an absolute solution of the innumerable questions of law which may arise daily in the conduct of business of this nature. The right of eminent domain is universally recognized, but its methods of enforcement are as varied as the number of the states. There is not nor can be any universal rule by which such matters can be determined. But we may determine that all proceedings under the law of eminent domain, instituted by a telephone company for the purpose of obtaining the right to set its poles and string its wires by virtue of statutory authority, must conform strictly to the provisions of the statute authorizing and regulating the subject (Crosswell on Electric Law, Sec. 130). And it may be added that in many of the states, as, for instance, in Illinois, condemnation proceedings do not give to the company a fee or ownership in or to the land, but merely a right to use the same for the purposes indicated, and which right may be lost in case the company at any time ceases to make such use of the property.

In the next article we shall take up a discussion of the liability of telephone and electric companies generally for injuries inflicted upon persons by the wilfulness or negligence of such companies, their agents and servants.

DECISIONS AFFECTING TELEPHONY.

PREPARED FOR TELEPHONY BY ANDREWS & MURDOCH, BERRIEN SPRINGS, MICH.

INJURY TO LINEMAN.

The duty that a telegraph or telephone company owes to its linemen to instruct them as to the dangers of their occupation is also shown in the case of Burgess vs. Western Union Telegraph Company, reported in the 108 Fed. Rep. 26. This action was brought to recover damages for a personal injury. Burgess, at the time of the injury, had, pursuant to directions of his foreman, Shadd, climbed a pole situated on a street in the city of Cleveland, Ohio, up to a distance of about forty feet from the ground and about five feet from the top of the pole, the pole being about seven inches in diameter, and was engaged in sawing off a section of the pole, supporting himself by placing his left leg around the pole, or "hugging" it with the left leg and placing the climbing spur on the foot of the right leg in the pole. He was sawing with one hand and holding with the other just above the point at which the saw blade was cutting through the pole, and when the pole was sawed about three-fourths of the way through the top section broke off and fell, striking Burgess, in consequence of which he fell upon the sidewalk, suffering severe injuries. There was evidence tending to show that the plaintiff was inexperienced and was changed from work upon the ground, to which he was accustomed, to the work of cutting down the pole, without any warning as to the danger or instruction as to the safest mode of doing the new work. The court held that upon such a state of facts it could not be said as a matter of law that he was guilty of contributory negligence in not inspecting the pole for himself to ascertain its soundness, or in the particular method adopted for sawing off the section, but that such question was one of fact for the jury.

RIGHT TO USE OF STREETS.

A decision of great public importance involving the limitations upon municipalities in their control of the use of their streets by telephone companies was recently rendered on rehearing by the Supreme Court of Minnesota. The case was one growing out of a claim of right by the Northwestern Telephone Exchange Company to the use of the streets of Minneapolis for its poles and wires. The council had by an ordinance required the telephone company to place its wires within a certain district in sub-surface conduits. Two principal questions were discussed in the decision: (1) Did the telephone company have any right from the state to erect its poles and wires in defendant's streets? If so, what was the nature and extent of such right? (2) Did the city possess a delegated power to control, limit, regulate or restrict the placing of poles and wires by plaintiff in its streets? And if so, what were the limitations of such right?

In 1860 the following statutory provision applicable to

telegraph companies was enacted: "Any telegraph company incorporated or organized under the laws of this state shall have full power and right to use the public roads and highways of this state, on the line of their route, for the purpose of erecting posts or poles on or along the same, to sustain the wires or other fixtures; provided, however, that the same shall be located as in no way to interfere with the safety or convenience of ordinary travel on or over the said roads or highways." This section was incorporated into the revision of 1866, where it continued without change until 1881, when this statute was amended by inserting after the word "telegraph" the words "or telephone." The Supreme Court of Minnesota has never recognized any difference in character between the telephone and telegraph companies. It has said "the transmission of intelligence by telegraph or telephone is a business of a public character, to be conducted under public control, in the same manner as the transportation of persons or property by common carrier." And again, as vigorously expressed in a later opinion: "In these days there ought to be no one to question the statement that the telephone is simply an improved telegraph."

In this case the court says: "In practical application it is not easy to recognize any difference in the subject matter (the erection of poles and wires on public highways), in the manner of erecting and maintaining the same, the public benefits to be derived or the burdens to be created, although the more extensive use of telephone exchanges has given to the latter improvement a greater utility; but, for the purpose of construing the effect of the legislative enactment referred to, no distinction can be made in favor of telegraph over telephone companies, in their imposition of burdens upon the public thoroughfares of this state."

It was contended by the city that the term "roads and highways" did not apply to city streets but was confined in its application to rural highways. After reviewing the various authorities the court states that the result of their investigation leads to the conclusion, seemingly too plain for serious discussion, that the word "highway," in actual use, embraces city streets as well as country roads, furnishing the strongest inference that it was intended to apply to both, and that, while the word "street" is more often used than "highway" to designate an urban way, yet it was in this statute used for both purposes.

Further discussing the right, the court says: "If we recur again to the historical facts which assist in defining the meaning of this law, we find that, so far as the placing of poles and wires on highways is concerned, that right was created by legislative action more than forty years ago, and it was continued in force and materially aided in the growth of this great commonwealth; and the only change of such right, until 1893, has been an extension of its benefits. For twenty years the telegraph companies of this state applied its terms comprehensively to cover their necessities upon all public ways, both rural and urban, when the telephone companies were given the same benefit. For ten years thereafter, at least, the telegraph companies exercised the same privileges as before, while the telephone companies during the intermediate period between the amendment and the origin of the long-distance service derived no other benefits than within the urban districts to which they confined their business, and to which it is now claimed the statute did not refer. In other words, the telephone companies were using, under the benefits of this statute, without apparent objection, the places where it did not, on defendant's theory, apply, and did not use the only places where it did apply, while the telegraph companies were using both for the same purpose; and the inference that follows is obvious and lies upon the surface. The people understood the law to mean what it said, and had found it sufficient to meet the necessities of the people of this state, and consonant with the demands of growth and progress, and for thirty years and more its benefits as to both kinds of companies were accepted, and it was not amended or changed." As a result of their review the court held "that the plaintiff had a right to use the streets of the city, under proper regulations and restrictions (referred to in the original appeal) by the municipality.

Upon the other proposition presented the court said: "We have not held, and do not hold, that the city had the power to confer upon the plaintiff vested rights to irrevocably occupy its streets, in violation of any reasonable right therein by the city. We hold that the only power delegated by the state to the city under any of the charter provisions referred to is the power of regulation, and the necessary control incident to such power. We held in the former opinion, and now hold, that the only contract entered into by the city with the defendant was with reference to the manner and method of placing its poles and wires. Such contract was within the police power of the city, and, the defendant having acted upon the contract by the ordinance of 1883 as to how it should place its poles and wires, the city cannot, without reasonable cause, in the exercise of its power of regulation, revoke its contract as to such matters and order a different arrangement. The power of regulation, or the police power, as there designated, belonged to the state, and was delegated to the city in its charter; and we think that the charter provisions referred to fully recognize its beneficent authority, which should be exercised in reason and judgment for the best interest and welfare of the municipality, and secures all that is essential to a proper and reasonable control of the plaintiff's business. It is not to be assumed that the legislature, in delegating such powers, intended to violate the organic law, or (what would be, perhaps, as bad in its practical effect) to invest the defendant with the power to confer a monopoly in the use of its streets to a favored corporation, which is the logical and necessary result of defendant's claim. If the claims of the city are well founded upon the issue raised by the demurrer, it can grant a right to-day, and deprive the party to whom it is granted of such right to-morrow. If it can confer the privilege upon the plaintiff of placing overhead wires on the streets, and immediately thereafter compel the plaintiff to replace the same in sub-surface conduits in rural neighborhoods, where there is no reason or necessity for such change, which purpose is admitted by the demurrer in this case, it might immediately thereafter compel the removal of the wires so placed in sub-surface conduits."

In summing up the court said: "We have reached the conclusion—which seems to us as clear as can be realized in any disputed legal controversy—that the power to place poles and wires in the streets of municipalities in this state has been conferred upon the plaintiff by the legislature; that the question as to the manner in which this power should be exercised to meet the demands of convenience and necessity was within the authority of the city; that the ordinance of 1883 was, to a certain extent, so far as manner and form, at least, are concerned, the subject of contract obligation; and that the subsequent ordinances of May and October, 1899, as alleged in the plaintiff's complaint and admitted by the demurrer, impose such burdens upon the plaintiff as to impair their legal contract rights, and to that extent must be restrained, leaving the question of fact yet to be determined, whenever raised in the proper manner, whether the provisions of those ordinances, or of any other that may be adopted, are within the limits of wholesome and proper municipal regulation.

With the view of the early adoption of an improved municipal telephone service, the local authorities of St. Petersburg are about to dispatch an engineer to make a comprehensive study of American systems. Russia has long been jealous of the commanding position held by Sweden in the field of telephones, and her technical authorities point out that the United States is the only country in the world in advance of Scandinavian ideas in telephone matters.

THE STROWGER AUTOMATIC TELEPHONE EXCHANGE AT NEW BEDFORD, MASS.

FIG. 1—AUTOMATIC TELEPHONE BUILDING.

If the Strowger Automatic Telephone Exchange has been slow in coming to the front the past few years, it is explained by the fact that during this time the rights and patents of the company have been through long and tedious litigation, which has only recently reached a satisfactory ending; also the fact that during these years of litigation the original owners of the automatic system have been quietly at work and have improved their apparatus to such an extent that to-day the exacting requirements of a first-class system for large exchanges have been complied with, at least to as great an extent as that of the standard systems, and at the same time the mechanical construction of the

FIG. 2—FIRST SELECTOR SWITCHBOARD.

apparatus has been greatly improved and does not present many chances for possible interruption of, or interference with, service.

The advantages lie in its absolute secrecy and entire freedom from interruption and untimely disconnection, together with the astonishingly rapid service it provides. There are very few complaints from subscribers. In fact, most cases of trouble are discovered and remedied without the subscriber's knowledge. Another unique advantage is that increase of business requires no increase of operators, as in a manual system. Every subscriber added is an operator added, and at no cost, thus doing away with that old telephone paradox, that the larger the exchange and the larger the business, the larger the operating cost. Whereas, with an automatic exchange, once started, the operating cost per station shows a constantly reducing ratio as the business increases. This is a very important item.

The latest improved switchboard is really an ingenious system of trunking automatically. It takes no longer to make a call between any two of a series of different exchanges than it does to make one in the same exchange in which a calling subscriber is located, as it only involves the same operation of apparatus as a local call.

Only two wires are used in its operation, and when a connection is completed a true telephonic metallic circuit is secured.

Absolute secrecy of service is maintained, and a party calling for a number already talking cannot get in on the circuit, but is automatically notified of the fact that the line is already busy.

The automatic switchboards (Figs. 2 and 3), made up

FIG. 3—SECTION OF SWITCHBOARD, AND TELEPHONES.

of small individual switches, connect a subscriber automatically with any desired telephone in the system. Hanging up the receiver makes instant disconnection.

The calling device on each telephone (Fig. 3) is operated by a simple revolving dial with ten finger slots on one side numbered from 1 to 0, which, used in combination, will call any number desired. The operation of calling is quick and simple. The figures of the number required are separately pulled down to the stop; by this action connection is made; the signal button is then pressed, ringing the bell of the desired subscriber.

The automatic system, as a whole, presents many new, valuable and interesting features, seems to be the proper development of the business and presents no greater difficulties of successful operation than are found in all substitutions of machines for manual labor. Compared with many machines in other lines of business which are doing the most successful and perfect intricate work, the automatic telephone switch is a simple piece of mechanism.

The above description applies to the New Bedford Automatic Telephone Exchange, which is a practical demonstration, showing that the advantages above mentioned actu-

ally exist. For over six months an increasing list of subscribers have found that the system does give the kind of service and the satisfaction that was promised them.

The Automatic Telephone Company of New Bedford has a capital of $100,000, and most of the stock is owned locally. The exchange has been built to serve 4,000 subscribers, all on private lines. It has more underground conduits than has the Bell Company in this place.

The Automatic Telephone Building (Fig. 1) is an ornamental brown stone structure, situated at the corner of South Second and Williams streets, directly in the heart of the city. For distribution purposes the company has used the poles of the Bell, electric light and street railway companies, consequently very few new poles have been set. It might be expected that telephone lines on poles that are carrying high potential currents would have induction ,buzzing and all kinds of noises to interfere with first-class service, but such is not the case with the automatic system in New

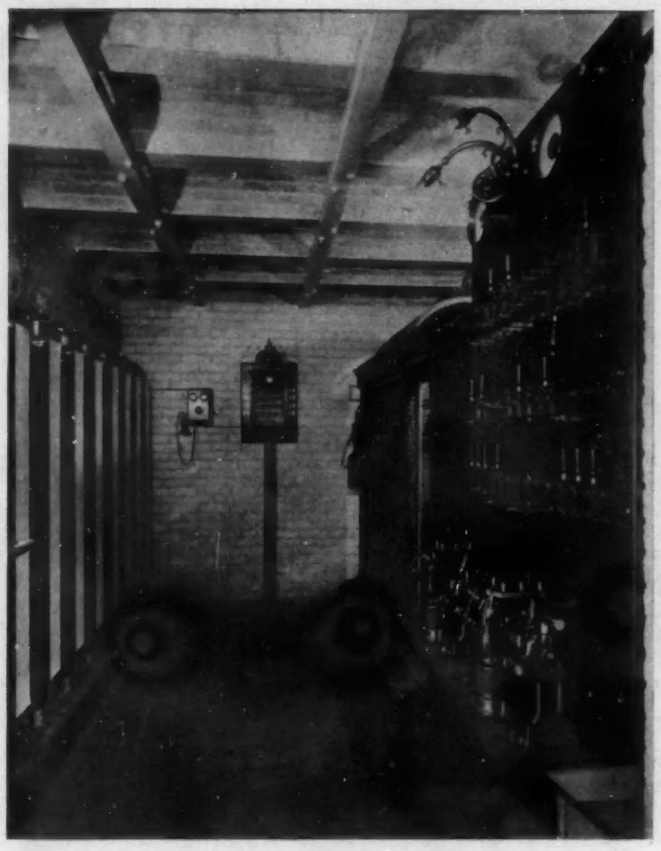


FIG. 4—TERMINAL AND POWER ROOM.

Bedford, for the longest lines are at all times free from disturbing influences, and the talking is more clear and distinct than on the lines of the older company.

This exchange was opened to the public December 1, 1900, and has steadily gained in popular favor, with new customers constantly on the list waiting for connection. The city of New Bedford is using 58 automatic 'phones, and with two or three exceptions no more contracts for the renewal of Bell telephones are to be made for city offices.

One attendant is employed in the exchange room during the day to look after the switchboards. When he is absent, as he is part of the time, a boy or the janitor of the building looks after the apparatus. The service is maintained all night, Sundays and holidays, with no other attendant than the janitor of the building, who has familiarized himself with the working of the system.

It is easy to locate trouble in this exchange, since each subscriber's instrument and connecting wire are systematically defined and located, and therefore are easily repaired. In the event of one section of the switchboard being burned out, the rest of the exchange remains operative. In case of a line fuse being blown, its location is shown by an annunciator and a bell rings to attract the attention of the attendant. In case of a switch fuse being blown an electric light indicates the location and another bell rings.

The terminal and power room (Fig. 4) is fitted with cable terminals and fuses in which terminate the ten underground cables of 100 pairs each. From the terminal heads the lines are connected to a very compact distributing board that has contacts for 1,600 subscribers on a surface 5.5 feet by 5.25 feet. In this room are also a duplicate set of dynamotors that operate at 100 volts and of one-third horsepower capacity, used for ringing the subscribers' bells and for operating the rotary movement of the switches, which automatically selects a proper trunk or subscriber's line.

Energy for operating the automatic switches is drawn from either of two storage batteries, each composed of 50 cells.

It should be noted that as the system is made up at the exchange of a number of exactly similar units, any desired extension of capacity can be made by additions of these units without change of those already installed.

The cable terminals and fuses, also the pole top terminals, were made by the Sterling Electric Company. The dynamotors are from the Holtzer-Cabot Electric Company. The power switchboard was supplied by the Local Hill Electric Company. The lead-covered cables are from the Standard Underground Cable Company, and the telephones and switchboards were furnished by the Strowger Automatic Telephone Exchange of Chicago.

Soon after the exchange opened for business it was given a severe test by being used for election returns in an exciting local contest. This test showed the capacity for use in this system to be much greater than in a manual system. It was remarked by the winning candidate for mayor that he could get returns from half a dozen precincts over the automatic quicker than he could get central over the Bell lines.

The company will extend its lines to cover the surrounding towns and to the city of Fall River, 14 miles distant, where a still larger automatic exchange is practically completed, and will begin giving service in July.

The automatic rates are $36 for business and $24 for residence telephones, all on private lines with unlimited service. Practically all the business houses are using the automatic. Those who require long-distance lines can use the Bell 'phone at reduced rates, the two 'phones costing less than was formerly paid for one.

Inquiry among the subscribers has shown that they are not only perfectly satisfied with the automatic system, but that they have found the service vastly superior in every way to that of the older company.

Out in North Providence there is a telephone line connecting the houses of two men who live some distance apart. For convenience and economy the wire of the line was strung along fence posts for a portion of the way, and when the North Providence funny man came across this line the other day he was at once interested.

"What's that?" asked he.

"Oh, that's a telephone line, I believe," was the answer. "Sort of a private affair, you know."

"Political telephone, eh?" queried the humorous one.

"Not that I know of," said his informant. "What makes you think it is, anyhow?"

"Well, I think it must be; it's on the fence," answered the alleged wit.

"I enjoy TELEPHONY and consider it one of the best special trade journals in the country. The Independent telephone interest is under obligations to you for the exceedingly valuable and useful monthly you are providing.

E. B. FISHER, Sec.,
Citizens' Telephone Co.,
Grand Rapids, Mich."

TOLLS AND TOLL LINES.

BY R. S. ABBOTT.

In selecting for my text tolls and toll lines I realize fully that I have undertaken quite a task, and regret to say that my limited time will preclude the possibility of covering the subject as thoroughly as I would have desired.

Undoubtedly a great deal of the ground I shall cover will be as chaff to a good many of you, but at the same time I hope that some will be able to profit by my observations, which, as before stated, being limited, will not be as thorough as it might be. My travels being limited to Wisconsin and Michigan, my observations have been confined to Michigan alone, this article having been inspired by the decidedly apparent difference between toll line business in the two states, the comparison being greatly in favor of Michigan. It is of course necessary for me to frequently use the long distance, and not only the service but the amount of toll charged has brought about this judgment. There is no question but that it is absolutely necessary for the Independent companies of this state to adopt a standard system of toll charges, such as used in Michigan and states east thereof. Your toll rates at the present time are entirely too high and are seemingly charged without any system whatever. I do not wish to appear too severe in speaking in this manner and trust you will appreciate the fact that I do so only in the hope that matters will be adjusted to the end that it will rebound to your financial interests.

So far as I can learn most of the toll construction of this state has been of No. 10 B. B. wire, which is fairly satisfactory. There has been very little copper used, and I regret to say considerable fence wire. But as I seem to be getting into the question of construction I must switch the subject until a little later and confine myself to rates, regarding which, as stated previously, there seems to be no regulation. I am going to cite the conditions prevailing in Michigan for the simple reason that the Independents of that state seem to be better organized and more appreciative of the possibilities of toll lines than the Independents of Wisconsin. It is only a question of time (and a very short time at that) before Wisconsin toll service will be extended to the states east thereof, which with the present system will mean inside of one year direct communication with Boston, New York, Philadelphia and other large eastern centers. In order to have the benefit of this connection, not only the proper construction, but an adjustment of rates will be necessary. It is not very long since, that in this state I had occasion to talk to six points within a radius of twenty-five miles, with an average of fifteen miles. The service cost me just exactly $1.65, which was entirely too much, although I am willing to throw out the element of personality. The service to these points was good, bad and worse, being transmitted by construction from the best to the poorest, or from copper to fence wire.

At another point my toll charge for eighteen miles over fence wire was twenty-five cents. It is a great mistake to ask any such rates, as you are undoubtedly "killing the goose that lays the golden eggs." It is the same with the use of toll lines as with the user of the telephone—once a subscriber to a telephone he wonders how he ever got along without one and decides that it is a necessity—if you succeed in getting him started on toll business he will keep it up. A man will, however, use ten-cent or fifteen-cent service three or four times where he will hesitate to use a twenty-five-cent service once.

The Michigan Association recognizes this fact and cooperates with Ohio and Indiana with the result that an agreement known as the "Michigan Contract," of which I have a copy, was adopted for all toll business for Independent companies of that state—Michigan. I have two maps here which will illustrate the method of adjustment. You will note that from the center point the zones radiate throughout the state. The first five circles drawn to a scale are at a distance of 12 miles each; beyond these the circles are 10 miles each. The rate charged for the first zone of 12 miles is 10 cents, with 5 cents additional for each succeeding zone, so that at 60 miles the rate is 30 cents. Beyond the 60-miles circle the rates are 5 cents per circle of 10 miles, or at the rate of ½ cent per mile. The central point referred to in this map is Grand Rapids, rate mentioned being for five minutes additional time at same rate.

I have here another map with the central point Hastings, by which it is shown that the toll rate from Hastings to Grand Rapids is 20 cents. By referring to the first map you will see that from Grand Rapids to Hastings is within the 20-cent circle, which makes it clear as to the Michigan schedules; or, in other words, take any point in the state, radiate on the same basis, and you will have identically the same rate between any two points.

This arrangement, however, is not arbitrary, there being exceptions, as follows:

First. What is known as a "county seat rate," which is, as a rule, 10 cents between any point in the county and the county seat.

Second. What is known as a "competitive rate," which means that if competition has established a fairly reasonable rate between two points a little different to the rates established as per schedule, then the Independent company may meet that rate.

Third. What is known as a "popular rate," which means, for instance, where the rate by actual measurement between two well known points under this schedule might be a little *over* 25 cents may be made 25 cents.

Fourth. What is known as "joint rate," and also "triangular rate," as, for instance, where the regular rate is 10 cents from point No. 1 to the junction point and 10 cents from point No. 2 and the junction point and the distance straight across from No. 1 to No. 2 being only 10-cent rate under the schedule the charge shall be 10 cents, inasmuch as the user of the line is not responsible for the fact that there is no direct line connecting between point No. 1 and No. 2.

I might illustrate this better by taking Marshfield, Wis., as point No. 1, Grand Rapids as the junction point, and Stevens Point as No. 2. You will readily recognize the fact that Marshfield, in wishing to speak to Stevens Point, should not have to pay for the wire mileage if the message must necessarily be transmitted by way of Grand Rapids.

The Michigan Association, by adopting this schedule, not only found relief from their troubles of toll charges, but have also found their revenue greatly increased.

This schedule I do not mean to say applies arbitrarily to the toll lines operated by any particular company who may adjust rates over their own lines as they see fit. Although in Michigan it has been found to be to the advantage of the company to arrange practically for this toll charge on the basis of this Michigan agreement, each company signing this agreement has a right to fix and control rates for messages passed solely over its own lines, and by agreement with its immediate connecting companies may fix the rates for messages originating on its own line destined to points on the immediate connecting lines not more than 60 miles, from the junction point or point at which such message is transferred from the lines of one party to the lines of the other; but in all other respects the toll rates to be subject to the Michigan agreement.

In view of their success I find it necessary to cite the Citizens' Telephone Company of Grand Rapids. This concern started about five years ago with a capital stock of $100,000. It has grown to such an extent that at the present time it is capitalized at $1,000,000.

Its success has been such that it has been warranted in paying regularly 8 per cent to the stockholders, with the result that perfect strangers—citizens of Grand Rapids—walk into their office and ask to buy stock.

At the time it started the Bell company had 1,400 subscribers—to-day the Bell Company has 4,100 where the Independent has 3,700; this difference in favor of the Bell is

explained by the fact that their residence rate is 50 per cent below that of the Independent.

The Grand Rapids Company found it necessary to build toll lines, and in so doing have found it also necessary to buy up the various exchanges which really hampered them instead of assisting—as Manager Tarte explained to me: "I find it necessary occasionally to ask another Independent exchange manager would he please go out and make some necessary repairs on the line—this manager would reply that he would as soon as possible; that might mean anywhere from one hour to twenty-four hours; in the meantime the toll business was suffering. Where these exchanges were bought up all that was necessary was to issue an order to this manager to go out and fix up the trouble and it was remedied, generally, within two hours, so that the delay, if any, was very slight.

About a year ago this company had a toll line running north from Grand Rapids as far as Traverse City, whereas the Bell had none. At that time the average toll business per month was 500 messages. This line was contructed of No. 10 B B; the distance was 120 miles on an air line. They found this iron wire inadequate and put up a circuit of No. 10 copper, which was completed about December last. In that month the exact number of messages was 1,010; in the month of January, 1,050; February, 1,183; March, 1,483; April, 1,769; May, 1,687. In the month of April the lines were so crowded that patrons were compelled to use the Bell lines, the Bell Company having built a copper circuit up through that section just as soon as they saw the Independents were so doing. This will explain the reduction in the toll messages for the month of May, which is practically 100.

Now taking in for the month of April, in which there were 26 working days, we have an average of 68 messages per day. The Bell Company figure that any line operating more than 35 messages per day is overworked, so you see that another fallacy of the Bell Company is hereby exploded. These people found that one copper circuit was inefficient, for I might state right here that after copper was put up exchange managers refused absolutely to use the iron circuit excepting for local work.

The Citizens Company then put up another circuit, the result being that up to the time of my getting this information from them the two copper circuits had turned in jointly an average of 100 messages per day. These people estimate it inadvisable to use an iron circuit for more than 50 miles, although the same circuit will talk satisfactorily 100 miles. Their discrimination being from a point of economy, inasmuch as they can get more messages over a copper wire, it, of course, means a greater income. I think that the map covering this Michigan agreement previously referred to covers practically the general charges for toll rates—there is one particular exception which I have not noted, and which I wish to call to your attention, that is the rate between Grand Rapids and Muskegon, the distance is 40 miles and the rate before the Michigan agreement was 20 cents. Upon request of the business men of Muskegon, this rate was reduced to 15 cents, with the result that actual cash receipts have increased 30 per cent.

It is a well-known fact that, like gossip, long-distance talking spreads, and where a reasonable rate is made in the shape of reduction, the amount of receipts is bound to increase very materially.

If this association will get together on this matter and readjust rates, I have every confidence in the belief that you will meet with the same success as the Michigan companies, which has been an average increase in actual cash receipts of 50 per cent over what it was when rates were adjusted in a haphazard fashion.

The division of the toll rate between two companies is made by air line land distance, the distance being measured from junction point to point of origination and destination.

In Michigan to a purely toll station they pay 15 per cent of the originating toll business; if it is an exchange, 20 per cent of originating toll business; in some cases 25 per cent of originating toll business, as well as rentals. These figures apply exclusively to a branch exchange and is the remuneration paid to the manager of same until such an exchange is large enough to warrant a combination manager and line man, who can give his exclusive time and attention to the business. The method of division between two companies over whose lines the toll message passes is on a pro rata of mileage over each company's lines from the junction point on a basis of air line land distance. As, for instance, if the total message covers 100 miles—40 miles of one company's line and 60 of another—the toll is divided up 40-100 and 60-100.

Where a message originates with a company having no toll line, said company is allowed 25 per cent on this originating business and nothing whatever on incoming business. Where the message originates in an exchange having no toll line, passing over the toll line of company A to the junction exchange B (having no toll line), and then over a toll line owned by C, a cash report is made to the owner of the toll line A, who adjusts the settlement with the other company; in this case the originating office has 25 per cent of the business and the other 75 per cent is divided up on the basis mentioned previously between the owners of the two toll lines, and the junction point B, who switches the message, gets nothing out of it, it being a general understanding that inasmuch as he is in the telephone business it is part of his duty to switch messages through his office, inasmuch as his exchange is benefited greatly by toll line connections. Of course, if the business is large it is probable that junction point B will kick about having so much switching to do and getting nothing for it, so that it will be necessary for each case of this sort to be adjusted separately.

In one case in Michigan, viz., Lansing, the exchange gets 2 cents per "through message" for switching. At another point north of Grand Rapids is Manton, which is strictly a switching point; in this case the Citizens Telephone Company of Grand Rapids pay the operator $15 per month in addition to 25 per cent for originating business. They also pay the rent, which is $9 per month, making a total carrying charge of $24 per month for this switching point.

In the case I have mentioned previously, of the branch manager where they pay 15, 20 or 25 per cent, the manager furnishes everything, such as light, heat and rent, but he does not look after trouble on the line.

In the foregoing I have probably exhausted myself on toll rates. I have, however, a copy of the Michigan contract, Michigan schedule, and interstate traffic agreement, which I will be pleased to show to any one of you that are sufficiently interested in same. This interstate traffic agreement to which I refer is between the United States Telephone Company of Cleveland—distinctly a toll line company—and the Independent companies of Indiana, Ohio and Michigan. You can realize the importance of this agreement when I tell you that these three states have adopted what is known as the Michigan Schedule of Zones, and that within three months they will have connections with Pittsburg, and within a year, New York and other eastern cities previously mentioned. It is only a question of a short time before Illinois and Wisconsin will be pressed into this inter-state agreement, and as Illinois is in a much better position than Wisconsin, this brings me to the subject of the contruction of toll lines. I am aware of the fact that at a previous meeting a standard of construction was agreed on, and I am also aware of the fact that this agreement has not been lived up to. There is precious little No. 10 copper in use among the Independents of this state and entirely too much fence wire. At the last meeting I recall that a member of this association stated he had built a toll line, or perhaps it was a farmers' line, at a cost of $10 per mile. At the time I did not think particularly of this, but now it occurs to me that he must have used second-hand fence

wire, and No. 14 or finer gauge at that, for No. 10 galvanized fence wire would have cost him over $8, to say nothing of the poles, insulators and labor.

There should be nothing used below the grade of B B iron wire and the guage should not be less than No. 10. If the matter of construction was given proper consideration, I do not think you would use anything else but copper, although to be frank with you any supply man would much prefer selling you iron wire.

Among my papers here I have the cost of construction per mile of single circuit of three telephone companies.

The United States of Cleveland estimate their cost per mile for the first circuit of No. 10 copper, $275.

The Citizens Company of Grand Rapids have itemized for me their cost of construction per mile for labor and material, which is $126.62 exclusive of the wire.

The Union Telephone Company, Alma, Mich., which is distinctly a toll line company, have itemized their cost exclusive of wire at $121.10.

Now, when you come to add the cost of a circuit of copper you will note that the cost is practically $200. This is a large discrepancy in comparison with the United States Company's cost, which is explained by the fact that they use the finest material obtainable, trim their poles to a point, paint them and double guy every fifth pole. The other companies mentioned set 35 poles to the mile with all corners doubled, making an average of 38 poles to the mile, all being set in the ground five feet deep and equipped with a standard ten-pin cross-arm, with insulators for one iron and one copper circuit.

There is one item in this cost that appeared high to me until I had itemized, and that is for stringing wire, which is $6 per mile, or $12 for metallic circuit. No doubt this will also appear extremely high to you, but at the same time my figures are obtained from a man who was eighteen years superintendent of the Michigan Bell Company and consequently I figure that his estimate is correct.

The poles used in this construction are 25 feet 6 inch cedars, the depreciation of which is about 5 per cent to 6 per cent, so that the life is fifteen to twenty years. A good many of you no doubt use "tamaracks," and if it is possible I want to deal the tamarack a death blow right here, for it certainly is an expensive construction in the long run. They depreciate 20 per cent to 25 per cent, so that practically you will have to rebuild your poles in five years.

Of course you will appreciate the fact that I am not making this statement on my own experience in this business, as it has been decidedly limited, but it is made on the experience of Michigan companies, and if, as has been the case, you refuse to profit by the experience of predecessors in exchange construction, the lesson gained thereby should teach you something as regards "following my leader" in the construction of toll lines.

After two or three years, where tamaracks are used, it is necessary for you to send a man out a few miles from town on account of a tamarack being down. A couple of days later, a mile or two farther along, another pole or two will be down, and so it goes. Now, it costs money to send a trouble man out, all of which could be avoided by proper construction in the first place.

The main issue in my statement, however—and I do not want to be regarded as speaking selfishly—the main issue, as I have remarked, is the wire.

Fence wire will cost you $8.50 per mile.

B B wire a trifle over $12 per mile.

E B B wire a trifle over $13.50 per mile.

Copper wire, $30 per mile.

This, being for No. 10.

Your poles cost you the same, your labor in setting and stringing the wire—cross-arms, insulators, etc.—and why anyone should try to save $5 per mile by using fence is too deep for me, when the life of fence wire cannot be over seven years under the best conditions; whereas B B and E B B will last not less than three times as long under equal conditions. To carry this point further, there is no limit, practically, to the life of copper, and it must certainly increase the value of your plant should you ever desire to sell it.

I have a customer in Michigan whose scheme for putting up copper is good. Of course he meets with the same objections from his board of directors that any of you would, but notwithstanding he is usually successful in having his way about the copper circuit. We will take, for instance, in order to illustrate his method: At $200 per mile for 50 miles toll work construction of B B wire is $10,000. Now he does not say to his board of directors, "I can put up B B wire at a cost of $650, whereas copper would cost me $1,500," but he lumps the whole thing up, stating, "Gentlemen, for a 50-mile circuit, if B B wire is used, it will cost us $10,000, but I can put up copper for $10,850." This represents an advance of about 8 per cent, and this board of directors, knowing by previous experience that the increase of cash receipts from copper toll lines has been 50 per cent, at least, over iron, they will undoubtedly say, "Put up copper by all means." I hold this cannot be regarded as a subterfuge, but if so the parties who are paying for it are getting a better return for their money. There is big money in toll business when handled judiciously, as illustrated by the fact that there are several companies throughout the country connecting with Independent companies who never put up an exchange excepting when it is absolutely necessary.

We have the United States Telephone Company of Cleveland as one of these; the Union Telephone Company of Alma, Mich., as another, and the Badger Long Distance Company of Wisconsin.

As I have stated, there is big money in it, more than in exchange work, but the service must be satisfactory or else the Bell Company will most assuredly get the patronage.

The Independent movement has grown to enormous proportions and co-operation is necessary for the continuance of it. A cheap toll line is worse than none at all, as the tendency is to disgust the Independent telephone user. You have gotten beyond the experimental point, or at least should have done so, by this time, and should either construct lines properly or not at all. No company should hold another one back, "clogging the wheels of success," by poor construction, and from now on there should be absolutely nothing in this state in the way of toll line construction that could be criticised.

I do not know whether this Association has a map of the Independent toll lines and exchanges in this state; certainly I have never seen it, and I get over the state pretty thoroughly. If they have they are few and far between, and it should be seen to at once that every Independent in the state has a copy. (Refer map Iowa.)

I do not know how the number of Independent telephones in this state compare with the total number of Bell, but there should be data to encourage new companies to start up, if for nothing else.

From a paper read by Mr. S. P. Sherron before the recent National Convention at Buffalo (held this month) I quote the following:

"When the first Independent telephone exchange was constructed in Indiana, the Central Union Telephone Company had been paying, for twelve years, on a capital of $6.300,000 (three-fifths of which was pure water) annual dividends ranging from four to six per cent. It had no bonded indebtedness and no floating indebtedness that was reported.

"When the fight with the Independents began, it ceased paying dividends, the last one being paid in 1895. In 1897 it borrowed two and a half millions of dollars; in 1899 it borrowed six millions of dollars, two and a half of which was set aside to pay the holders of the first mortgage of two and a half millions. The company now has, in addi-

tion to this $6,000,000 mortgage (according to recent publications), a floating indebtedness of $1,250,000.

"Now, let me tell you what all this has resulted in: The Central Union now has (as shown by its own figures) 22,000 telephones in the state. The real number is smaller than this, but we can afford to be generous, and I propose to give it all it claims. The Independent telephone interests have in the state of Indiana, by actual count, 52,469 telephones. I know you will excuse me if I repeat those figures. After a 'war expenditure' of seven and a quarter million dollars—begun upon the Independent movement when there were less than 3,000 Independent telephones in the state—the central Union now has, for its expenditure, 22,000 telephones and the Independent movement has 52,469.

"The total population of Indiana (according to the census of 1900) is 2,516,000. There are 92 counties in the state, and there are 27 of these in which neither the Central Union nor any other Bell company has an exchange, large or small. The population of these 27 counties aggregates 491,000, and the aggregate number of Independent telephones in these 27 counties is 14,262. The total number of Central Union and other Bell company telephones used at toll stations only in those 27 counties is 197."

From the address made by President Ware of the Michigan Association at their meeting of February 6 last, I learn that the United States Company of Cleveland and other companies owned by the same parties, besides owning numerous exchanges, including one of 6,700 phones in Cleveland and one of 4,600 phones in Columbus, owns more miles of toll line and is connected with more telephones in Ohio than is the Bell licensee companies. In this state—Ohio—the Independents had at that time more than 63,000 telephones in service as compared with the Bell company's nearly 44,000. The Independent companies were rapidly developing in the East, in Central New York and Pennsylvania, and the Baltimore Telephone Exchange had more telephones in service than the Bell. Mr. Ware assumed, that in view of the character of toll line construction in other states, there was every reason for Michigan to build with even greater care than they had in the past, and that they should endeavor to cover at least the lower peninsula with sufficient copper circuits to adequately handle the toll business, which was something that had not previously been done by any company or individual. The result of this has been that copper circuits have been put up extensively, and at the present time the Michigan companies practically use nothing else for their through business, although they invariably use a B. B. No. 10 for local points.

Mr. Ware went on to say that within the fifty mile radius of Grand Rapids the Citizens Company of that town had 230 exchanges and toll stations, where the Erie or Bell had but 91, which gives 140 in favor of the Independent company.

With Ionia, Mich., as a center and within a radius of 40 miles there were 77 points reached jointly by the Independent and the Bell, nine points by the Bell only, and 88 points by the Independent only, making a total of 174 points covered, to which the Bell had access to 86 points, whereas the Independent covered 165 or practically 100 per cent more. Of this total the Bell had 13 exchanges and 73 toll stations, as compared with the Independent's 37 exchanges and 128 toll stations.

Comparison between the Union Telephone Company of Alma, Mich., and the Bell shows 46 points reached by both, one point by the Bell only, 37 by the Union only, making the Union cover 83 points, the Bell 47, while the Union has 19 exchanges, 42 toll stations and 954 phones, with the Bell having three exchanges, 20 toll stations and 176 phones. Comparisons are odious, and there you are.

The Union Company has been out of debt right along and paying 8 per cent dividends, whereas the Bell has been losing money. "Less than cost" service has increased the number of Bell telephone companies in Michigan from 15,250 in 1897 to 42,500 July 1, 1900, the increase being largely residence phones at much less than average cost of operation and maintenance.

In Grand Rapids the Bell exchange has not paid the expense of operation alone for over five years. Its rates are $12 for residence and $24 for business anywhere within the city limits, whereas the Independents are getting $24 and $36 and are only a few hundred phones behind the Bell.

Although from the foregoing I have departed from my subject, I did so only to show how the Independent movement was having a natural growth, and this growth undoubtedly must be attributed to toll lines.

This Association wants to assume an aggressive spirit. If maps of exchanges, toll stations and connections have not been prepared, they should be at once. Builders of toll lines should adopt and stick by a standard of construction. There is no question but that copper is better than iron, iron better than steel, and steel telephone wire far superior to common galvanized fence wire, so that when any of you assume that fence wire is good enough you are making a mistake that is bound to react.

It is not very long since I talked to one of your members on this very subject, his contention being that he had been in the hardware business for fifteen years and knew wire when he saw it, and that fence wire was plenty good enough; that the only difference he could see between that and B. B. was in the cost. I have been in this telephone business a trifle over a year only and yet *I* know better than that.

I shall live in hopes that this article will tend to change that gentleman's opinion and that in the future his toll line construction will compare favorably with the best.

THE INDEPENDENTS AND MONOPOLY.

BY CHARLES H. SCHWEIZER.

Once upon a time, in the not very remote past, there appeared upon the earth a very interesting and wonderful bird. In it were combined all the qualities and abilities of the feathery tribe. It was not only useful, but ornamental. It carried messages with the wings of Mercury, outstripping the carrier pigeon; its song excelled that of the sweetest singer of the air, while it reproduced the voices of others with a distinctness and accuracy which put the mocking-bird's efforts to shame. It could even *tel e phony* story.

This peculiar species of bird was at first very rare and was supposed to be a native only of the United States. Careful investigators, however, soon found that it had inhabited other lands. But the owners of the new bird succeeded in prohibiting the importation of the foreign variety and controlled the home market.

Among the many wonderful accomplishments of this bird was its ability to lay a splendid variety of bell-shaped, golden eggs, which increased in size and number as the bird grew older.

Ordinary bird seed and bird foods would not satisfy the craving appetite of this "rara avis." Its principal diet was the necessities and demands of a progressive people, and as these constantly increased in the business world the bird grew with what it fed upon and waxed strong. The shadow of its mighty wings covered the whole country and everyone was called upon to pay tribute to its fascinating power.

Under ordinary conditions in this climate the life of such a bird was seventeen years. A peculiar birthmark in the form of the date of its birth was usually found in some conspicuous place upon it. Strange to say, the birthmark on this particular bird never appeared, or rather it contrived to hide it under its wing so that in time it might be obliterated and an unsuspecting public might never ascertain the actual age of this precocious bird, whose right to live off the public depended upon its age.

After many years and when it was generally believed

that the old bird had laid its last golden egg, and that its sands had run, there appeared upon the scene a new bird of the same general class, but of different origin.

The old bird looked upon this young and vigorous rival with contempt. Trespassing upon its rich and fruitful fields had been hitherto unknown and would not be allowed. The newcomer was a pest which must be got rid of in some way or other.

With much ado the old bird declared that its time had not yet come; that by the laws of birdland seventeen years of exclusive sway still remained to it; it claimed that its birthmark had never been stamped upon it and that the youngster had no right to live at all. The young bird was not affrighted. Prophets had predicted such things and it came into the world prepared to hear and see the worst. Fear, if either trembled, shook the old bird. Too long had it rested in the lap of luxury. The excesses of high and riotous living had sapped its strength and weakened its powers. Its plumage was in sad array, its wings old and weary, its vision poor and defective, its voice weak and indistinct and its mind and memory failing. Realizing its sad position, its inability to regain its former proud position and lost prestige through bluff and bluster, it began to make ready for the mighty struggle for existence which the appearance of its youthful rival made inevitable.

The whole world viewed the encounter with consuming interest. Many who had learned to love the younger bird, who admired its heroic efforts to release the people from the clutches of the old monster, at first feared for the new and untried fledgling, but as the contest proceeded all fears were allayed and confidence in its ultimate success grew with every hour.

One striking difference between the two contestants, not at first apparent, and which the struggle which was going on made manifest, lay in the fact that the old bird begot no young, while the younger bird was blessed with a large and ever-increasing progeny. Its young were hatched in every hamlet in the land. As soon as these became full-fledged they came to the front to reinforce and aid their faithful parent. It was a magnificent and inspiring sight as they swarmed onto the field innumerable,

> "As when the potent rod
> Of Amram's son, in Egypt's evil day
> Wav'd round the coast, up call'd a pitchy cloud
> Of locusts, warping on the eastern wind
> That o'er the real of impious Pharaoh hung,
> Like night, and darkened all the land of Nile."

So numberless were these new cohorts seen hovering on the wing to do battle for Right and Justice.

These allies merely goaded the old bird to greater effort. All its skill, all its powers, all its craft were enlisted in the struggle for supremacy; where force and sheer strength would not avail the arts of the subtlest schemers were called into action. Ways that are dark and tricks that are vain were resorted to. Temporary successes were scored at times by the old bird where its opponents were lulled to sleep by the sweet music of its golden tipped wings. But they were only temporary. Where unfaithful and faint-hearted ones laid down their weapons and gave up the good fight, their ranks were quickly filled by new and more aggressive flocks.

The battle is not yet ended. The struggle is still going on. New recruits are being constantly enlisted under the leadership of the young and fearless leader, fighting under the banner of Justice and Independence against the hosts of Monopoly and Greed.

This allegorical picture typifies the relations existing between the Independent telephone interests and the Bell monopoly. It represents the history of the Independent movement to this time; it illustrates its strength and points out its weaknesses.

The Bell monopoly is in the hands and under the control of one supreme and advisory agency. It is a constant united force and power working along definite lines actuated by one motive and endeavoring to accomplish one purpose. It aims to control and monopolize for its own use and benefit all communications by telephone in the United States. Its resources are almost inexhaustible. These are its most important elements of strength, but they also contain some sources of weakness.

The people of the United States are as a whole opposed to monopoly, no matter under what form it may appear. Submission on their part to the extortionate charges which have prevailed where no opposition existed, and which the Bell monopoly always exacts, has been under protest, and wherever the Independent forces entered the field their coming has always been hailed as a bow of promise of better things by an oppressed and long-suffering public.

In the loyalty of the people to honest efforts to get rid of the Bell monopoly lies the strength of the Independent movement. This loyalty has been so often exemplified that it may be counted upon as an assured fact ever present and always existing wherever the people have been obliged to submit to the Bell company's demands. Upon this loyalty of the people high hopes of the ultimate success of the Independent forces may well be built.

The number of Independent telephone exchanges which are being constructed and operated throughout the country and in almost every hamlet in the land, is another tower of strength for our cause. The Bell interests can never recover and hold the position which they formerly occupied so long as these small exchanges and the toll lines connected with them retain their independence.

The Independent forces, too, are growing from day to day. It will not be long before the Independent lines will have spanned this continent so that the Independent "hello" may be heard and will re-echo from ocean to ocean. We must not forget, however, that while strong in numbers, the fact that there are so many lines and exchanges operated by distinct and separate companies and interests is a source of weakness. The organization of these various companies and interests for the accomplishment of a purpose upon which are all agreed is the demand of the hour. Intelligent co-operation is what we want and what we should strive for. This is the purpose of state associations to so manage and direct matters as to produce better results to this end. In order to accomplish the best results the common weal must be placed above every selfish interest. The best possible service should be given to the patrons of the Independent phone. Their loyalty to us should be reciprocated by giving them the advantage of the lowest possible rates consistent with the best service. More than that; under no circumstances should an Independent company surrender to the Bell or abandon the field it occupies. The friends of the Independent movement who stood by it at its birth, supported it in its infancy and valiantly aided it in its young manhood have not deserved to be again subjected to the merciless exactions of corporate greed as exemplified and typified by the Bell monopoly. The Independents have in many localities throughout the land emancipated the people from telephone slavery and they should never become or permit themselves to become the instruments in the hands of the Bell interests to reinslave them.

Nor is there any necessity of permitting this to be done. Let us see to it that Independent lines and exchanges are brought up to the highest standards of excellence. Let us extend our lines, connect them with our neighbors', adjust our rates so as to make them useful and profitable both to the public and ourselves, and we may confidently look forward to the day when we shall be organized into one consistent whole identified in interest and unified in purpose.

Then we may all stand as giants in the field we occupy, shoulder to shoulder, ready for the fray with the mighty forces which will continue the struggle to wrest from us the already hard fought for and well earned laurels which adorn the brow of the young Independents.